Paper Trade Journal

Cylinder Board Machines — Manipulating or altering cylinder, vat and flow conditions can increase production and improve board quality.

Sulphite Digester Linings — Comparative study shows which design and specifications produce highest quality and lowest cost sulphite pulps.

Grinder Capacity — Discussion of the factors which influence stone production and power consumption in groundwood pulp mills.

MOORE & WHITE
DUPLEX BOARD CUTTER
and Air-Controlled
DUPLEX SLITTER

Rugged Construction for 'round the clock operation . . . On the Machine

The DUPLEX CUTTER can be adjusted while in operation for changes in lengths. A special feature also permits adjustment of draw between sections, assuring accurate cutting even when varying sheet conditions occur.

The DUPLEX SLITTER is designed particularly for use with the M. & W. Duplex Cutter but will also give excellent results with any other cutter. Changes in widths can be made in seconds while machine is in operation.

The MOORE & WHITE Company

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TOP HAND

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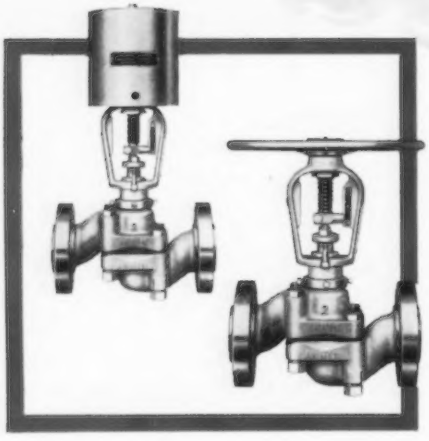
...Production and
Maintenance
are concerned!



ANNIN VALVES *meet every test of reliability, response and easy maintenance at low cost*

ANNIN VALVES are the only valves that meet the rigorous requirements of the missile program and the exacting demands of the modern process industries in a single standard construction at no premium.

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B.F.Goodrich report:

They wanted a belt that wouldn't stretch

B. F. Goodrich improvements in rubber brought extra savings

Problem: This is where they make the power to run all the equipment in a big plant. There used to be a leather belt on the generator, but it stretched so badly it had to be removed and shortened again and again.

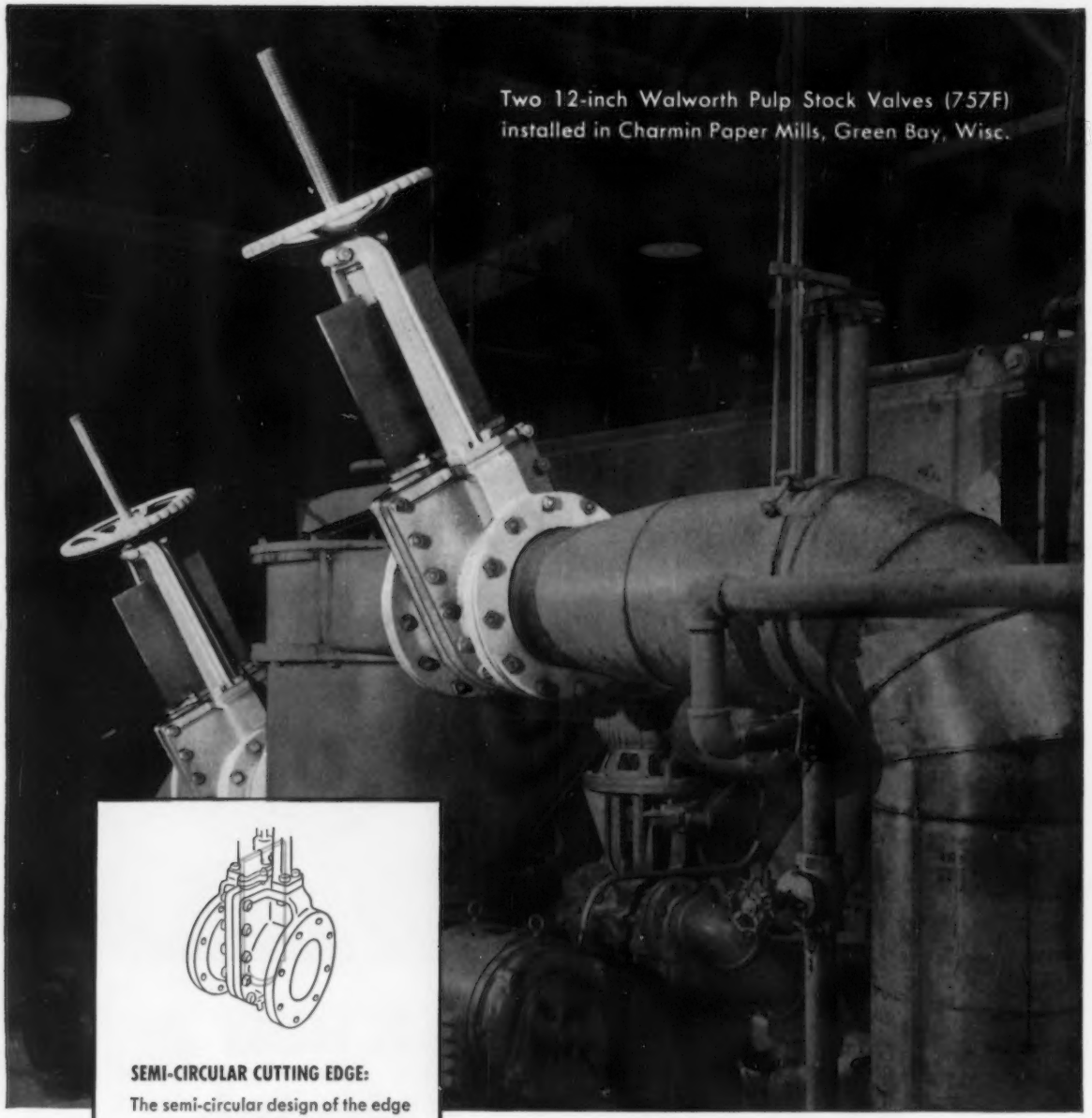
What was done: Then a B.F.Goodrich man got them to try a B.F.Goodrich "Highflex" belt—an improved design that has practically no stretch, better resistance to shock loads. The special rubber compound used in the belt can stand constant flexing, makes "Highflex" a more flexible, longer-lasting belt.

Savings: The B.F.Goodrich belt was installed, and lasted nearly five years, running 10 hours a day, 6 days a week, 9 months every year. No repairs were needed, not a minute was lost in shutdowns.

Extra benefits: This B.F.Goodrich belt, joined by the Plylock belt splice, eliminates the need for belt fasteners. Without the use of metal fasteners, laces or stitching, the Plylock belt joint produces a long-lasting, flexible splice practically as strong as the belt itself. Because 9 out of 10 belt failures are caused by metal fasteners working out, the Plylock splice often *triples belt life.*

Where to buy: Your B.F.Goodrich distributor has full information on the transmission belt described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* rubber products B. F. Goodrich makes for industry. *B. F. Goodrich Industrial Products Co., Dept. M-194, Akron 18, Ohio.*

B.F.Goodrich
INDUSTRIAL PRODUCTS



Two 12-inch Walworth Pulp Stock Valves (757F) installed in Charmin Paper Mills, Green Bay, Wisc.

SEMI-CIRCULAR CUTTING EDGE:

The semi-circular design of the edge of the gate affords more cutting surface than straight edged gates. The edge is beveled and hone sharpened and, coupled with the notched design of the body, shears through pulp fibers easily while valve is being closed.

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REMEMBER THESE DATES

OCT. 3-4: De-inking Conference at Hotel Niagara, Niagara Falls, N. Y.

OCT. 7-8: Paper Plastics Conference at Sheraton-Gibson Hotel, Cincinnati, Ohio.

OCT. 17-18: Fibre Box Assn. Annual Meeting at Sheraton-Park Hotel, Washington, D. C.

OCT. 28-30: Packaging Institute 19th Annual Forum, Hotel Statler, New York, N. Y.

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From Babel onward, men have held the vision of ever brighter, ever lighter towers soaring to the sky. Modern metals provided practical substance for the old dreams . . . look around at what's come true so recently.

High on any list of today's versatile, economical building materials you find aluminum and its alloys. Plate, sheet, rolled forms, extruded sections, tubing, wire, rod—forged, stamped, spun—this wondrous metal answers architects' aspirations, fabricators' requirements and users' needs.

With aluminum, as is so often true, the basic raw material is found in nature wildly mixed with other mineral compounds. Bauxite must be carefully purified to provide alumina, the effective starting point for aluminum. Here again, we're happy to report, major producers turn to Columbia-Southern.

Finely ground bauxite is digested with an alkaline solution, under pressure and heat. Treatment with the alkali separates bauxite into sodium aluminate (just several short steps this side of alumina) and a sludge of impurities called "red mud." No other chemical product known effects this necessary and delicate process so well, so economically as soda ash.

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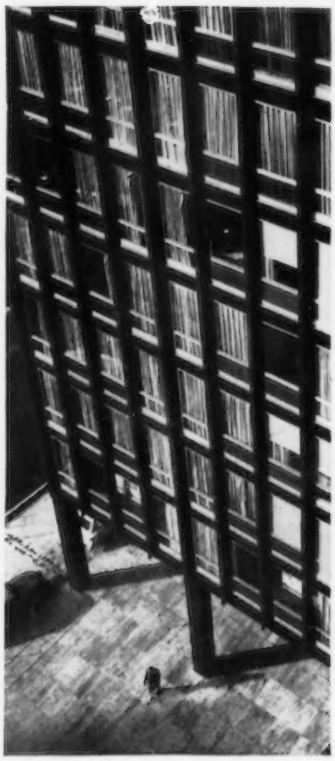

900 Esplanade Apartments, Chicago—a new concept in multi-story exteriors making extensive use of aluminum supplied by Reynolds Metals Company. Architect: Ludwig Mies van der Rohe

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chemicals at work

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IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

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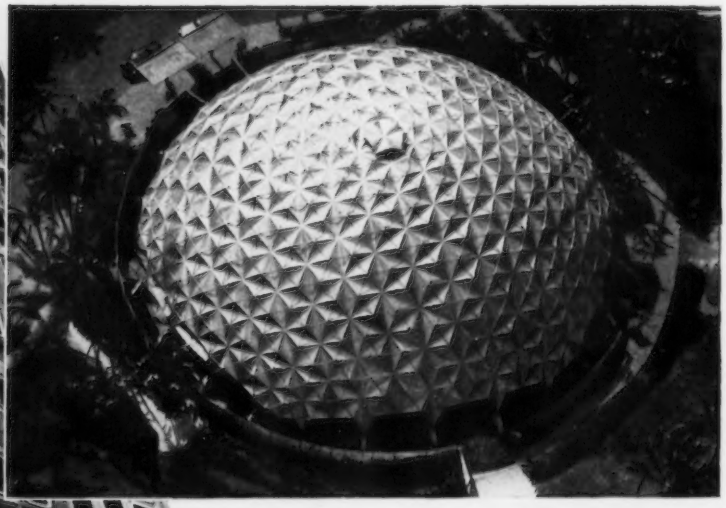
Aluminum-domed auditorium, first structure of its kind to be built, graces the Hawaiian Village Hotel in Honolulu. Designed by Kaiser Aluminum & Chemical Corporation.



need a Hydroscillator?

If wrinkles and/or hard and soft spots show up in your rolls, you certainly do need a Hydroscillator. Install one on your rewinder and those troubles will vanish.

Ross Midwest Hydroscillators are hydraulically operated—can be set to deliver strokes of from ½" to 3¾" as required. Oscillating speed from 0" to 24" per minute. Thrust up to 11,000 lbs. Effective on rolls of all sizes—even the very largest. Space required—very little.

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Bulletin No. 101 for details

Ross Midwest Fulton Corporation
Dayton, Ohio • U.S.A.

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SAYS MR. H. J. LAIRD, MANAGER–SALES PROMOTION, PAN AMERICAN WORLD AIRWAYS SYSTEM

"Am I glad we selected a sparkling white CALCOFLUOR-treated paper for this booklet! Its superior whiteness makes type more legible and inviting to read... cartoons are crisper and sharper, too. The booklet's effectiveness as a sales tool has been greatly increased through the use of this paper."

Just add the economical "Glow White" of CALCOFLUOR fluorescent white dye to your regular grades of papers—and watch them become preferred grades with printers... package designers... and advertising men! Papers treated with CALCOFLUOR White have a sparkling whiteness that *sells itself* to men who buy and specify papers.

CALCOFLUOR White PMS Conc. (powder) or CALCOFLUOR White PMS Solution is easy to use... costs very little... and puts you ahead of competition.

Ask your Cyanamid Dyes representative for our helpful Technical Bulletin, *DYEING PAPER WHITE*, or write for a copy.

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fast, easy plug removal cuts cost of maintenance and down-time

You don't have to remove the bearings or packing boxes from the shaft when pulling the plug for refilling. Head, plug, shaft, bearings and packing boxes slide out quickly as a unit.

heavy, one-piece construction assures precise alignment, maximum strength and rigidity

BLACK-CLAWSON

JORDANS

Solid, one-piece head and pedestal support are cast integral. Base, ribbed shell and drive end bearing support are cast in one heavy piece. All machining operations on this sturdy casting are accomplished at one time by use of a special fixture—radial and head end bores are concentric, thus assuring precise alignment.

Black-Clawson Jordans are built for pressures up to 125 lbs. Nine models available with or without Duotrol* automatic plug adjustment. Get the full story on the superior design and performance of Black-Clawson Jordans. Write to the Shartle Division. Ask for new Catalog 22-SB.

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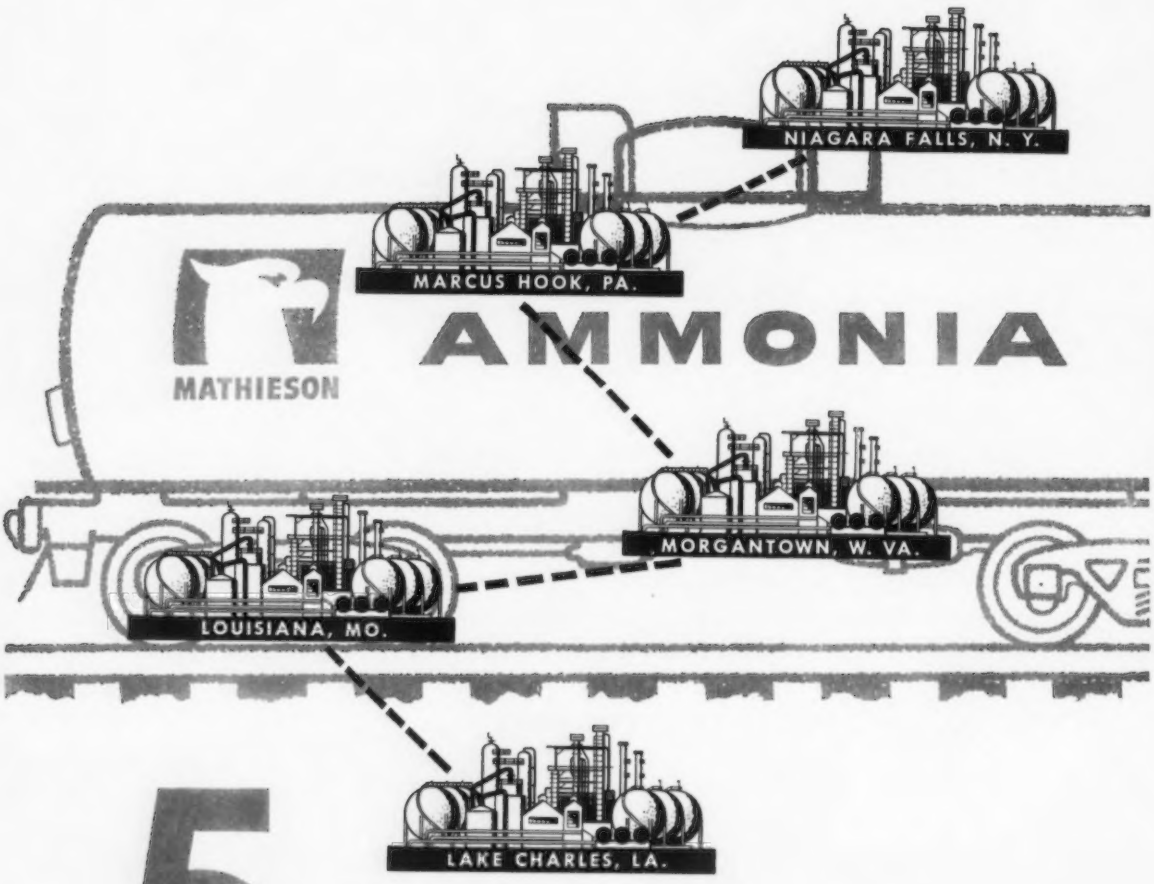

5 - plant safety

backs up every order for Mathieson AMMONIA

Sustaining your production at its most profitable levels is an Olin Mathieson specialty. The minute you "get on the Mathieson pipeline," your pulping operation is backed up by five full-time shipping points—strategically spotted from Canada to the Gulf.

Whether you want practical technical assistance . . . or whether you want first-hand information about the Mathieson ammonia "extras" of purity and supply . . . you'll find that half an hour with your Mathieson representative may lead to years of more profitable pulping.

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MATHIESON

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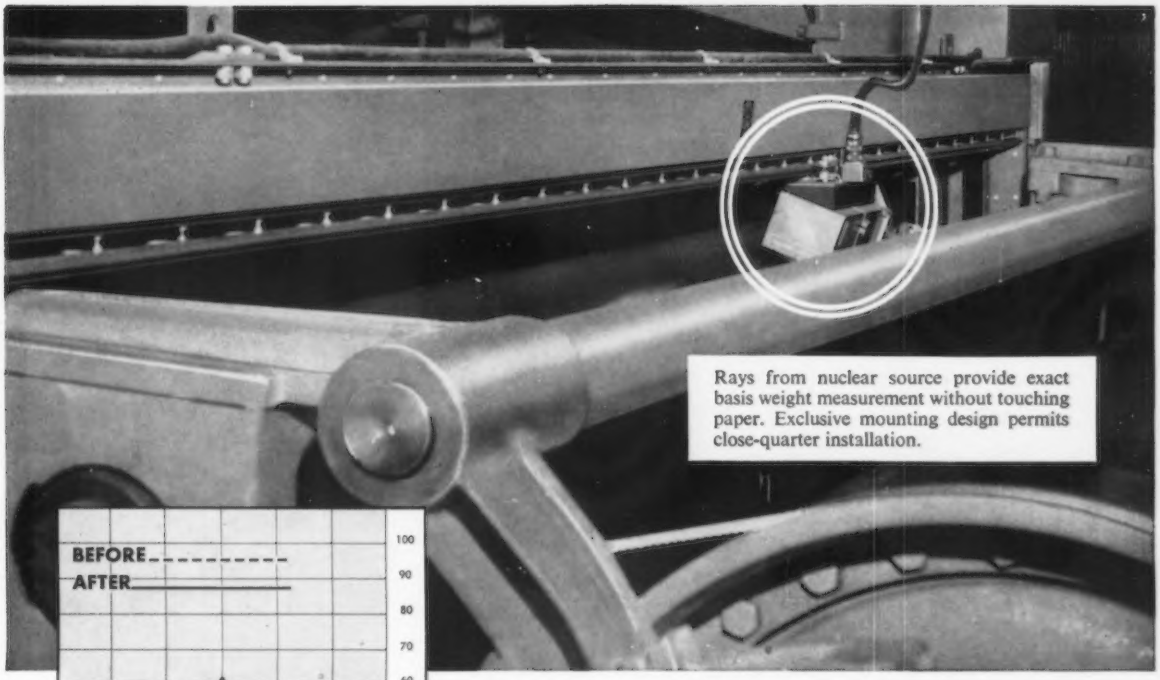
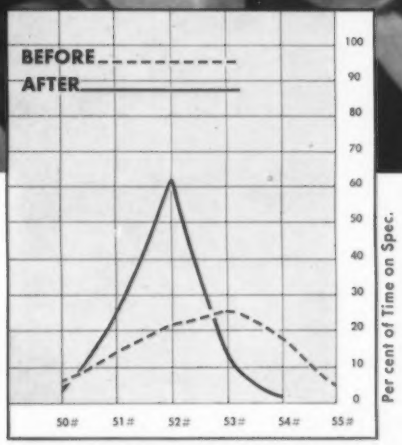


Rays from nuclear source provide exact basis weight measurement without touching paper. Exclusive mounting design permits close-quarter installation.



BEFORE, when hand weighed tear sheets are used for control, production can vary beyond tolerance.

AFTER installation of Curtiss-Wright System, uniformity sharply increases.

Curtiss-Wright Control System

Maintains Accurate Basis Weight Production for P. H. Glatfelter Co.

The P. H. Glatfelter Company of Spring Grove, Pa., produces up to 450 tons per day of fine grade paper. To insure continuous quality and maintain peak production levels on their newest fourdrinier, this leading paper manufacturer relies on a Curtiss-Wright Basis Weight Control installation to reduce weight variations in both machine and profile directions.

With Curtiss-Wright wet and dry end weight control systems, accurate settings on moisture extraction equipment can now be made. Machine speeds can be increased or steam requirements lowered, since the sheet enters driers in the driest possible condition.

Learn how Curtiss-Wright Basis Weight Control Systems can increase your on-weight production quality. Write Industrial Controls Dept., Curtiss-Wright Electronics Division, Carlstadt, New Jersey.

Write for information on Curtiss-Wright's NEW DRAW SPEED GAUGE.

Operator sets target weight selector on control panel. Profile and machine direction variations are presented on separate wet end recorders for machine tender's convenience.

WEST COAST REPRESENTATIVE:
Western Dynamics Co., 444 Dexter Horton Bldg., Seattle 4, Wash.

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View of one section of the conditioning room at the main plant, Albany, N. Y., the many colors and shades indicating the wide variety of specialized chemical treatments daily being applied to Albany felts, each proven by performance as best for its particular application.

Specific-Purpose Chemical Treatments by Albany Felt Improve Felt Performance

Albany's extensive research program is constantly improving existing treatments and developing new ones to meet your demands.

Worker supervises and regulates application of one of many specific-purpose chemical treatments to felts in Albany's finishing department.

YES, Albany Felt's advanced chemical treatments *can improve your felt performance* — in roughly 60% of the positions clothed. This percentage represents the share of Albany's felt production currently receiving one *or more* chemical treatments. As the industry's pioneer in the field of chemical treatments, Albany has a wide range of varied treatments, since *no one formula* has been developed to answer *every* demand! These include the B and D series which improve starting and wetting; the W-6 Treatment to provide bacterial control; Z-5 for alkali resistance; and the F, H, J and U series which offer resistance to wear, hardening, filling and stretch in varying degrees dependent upon the desired application. In all, more than 20 of these treatments are at work today, *each solving a specific problem better!* Ask your Albany Sales Engineer for information on those best suited to your needs—his goal, as always, to help you produce *more saleable tons per day!*

ALBANY

FELT COMPANY

Main Office & Plant, Albany, N. Y. Other plants: Hoosick Falls, N. Y.
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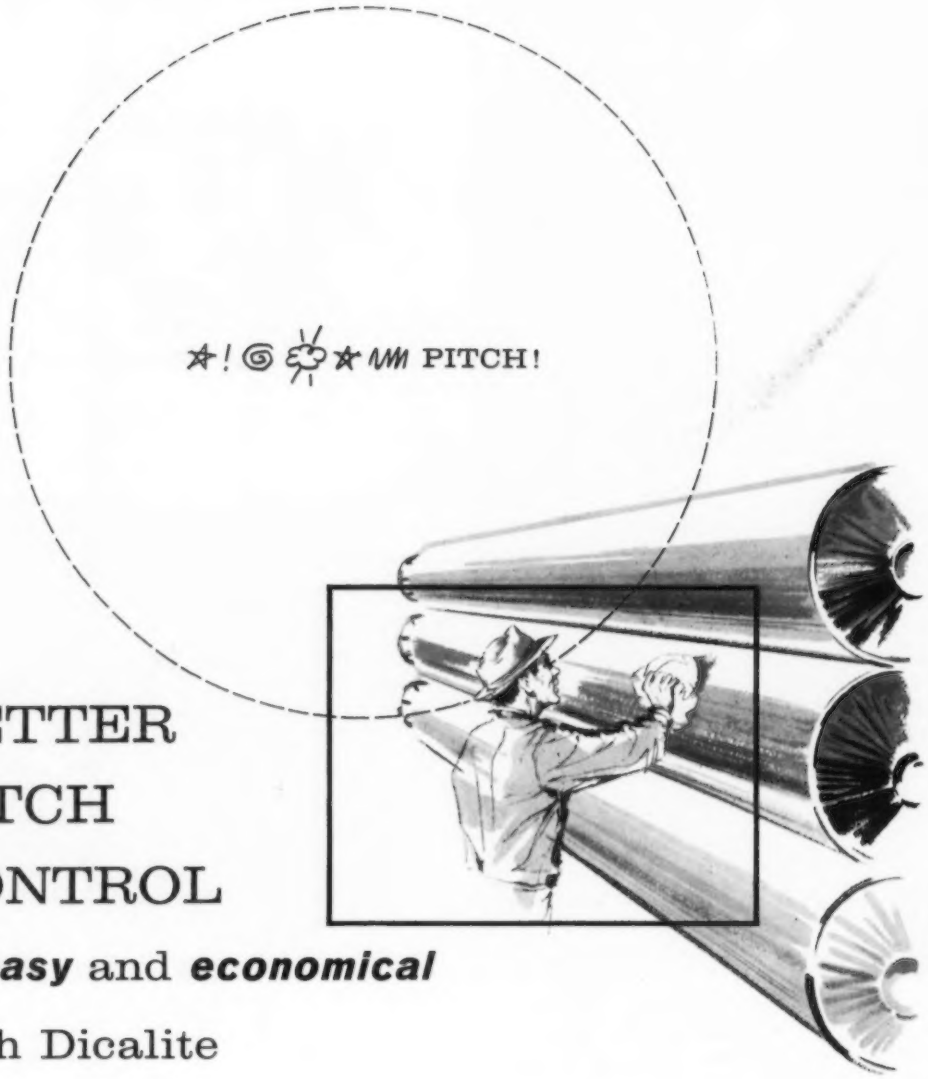
"THE WORLD'S LARGEST MANUFACTURER OF PAPER MACHINE FELTS"



BETTER PITCH CONTROL

is ***easy*** and ***economical*** with Dicalite

PITCH won't cause you much trouble if you use the correct amount of Dicalite to control it. Some paper makers prefer to add Dicalite at the digester along with the chips—here, about 2% of Dicalite should be used, based on the weight of the chips. Others add Dicalite at the beater, in amounts ranging from ¾% to 2%, the exact amount depending upon the amount of pitch in the pulp and somewhat upon operating conditions.

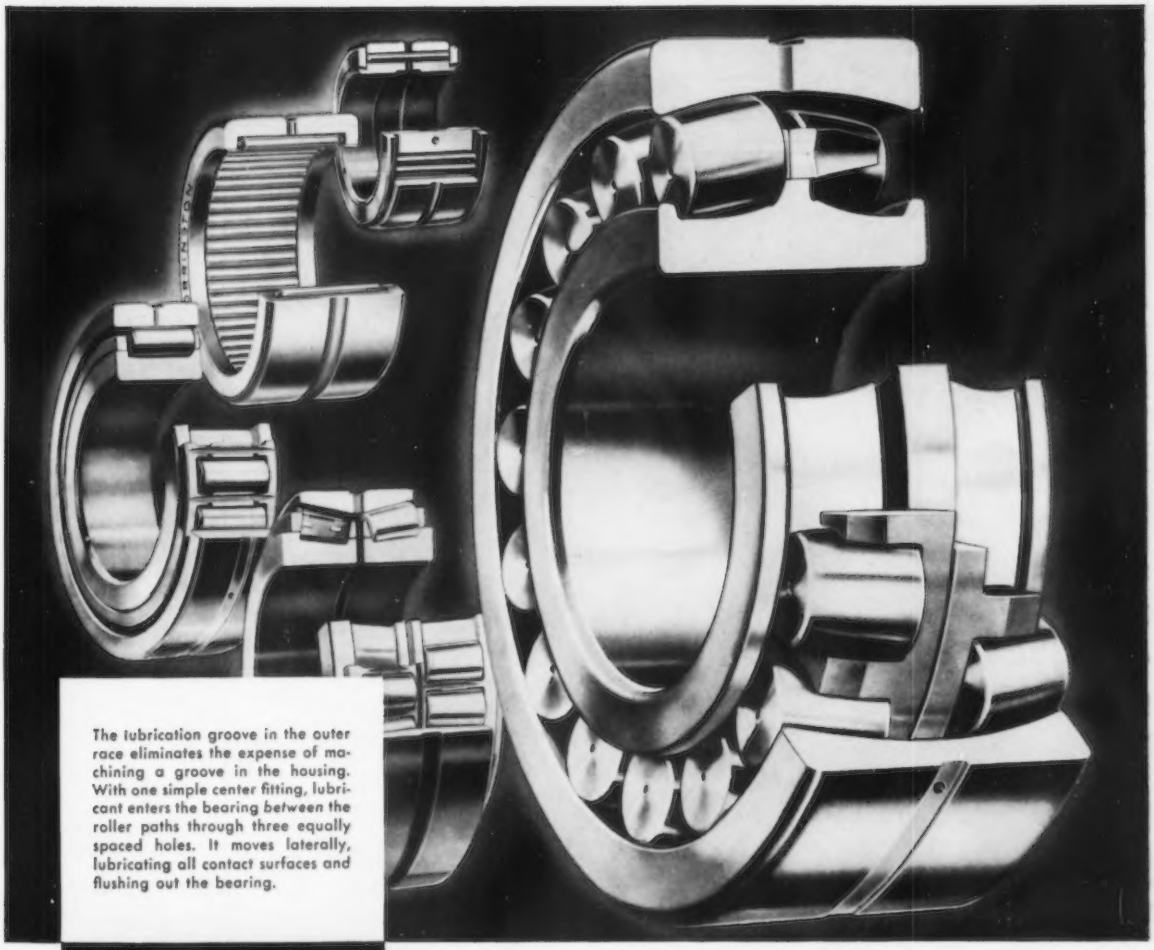
No, Dicalite doesn't remove the pitch—it just prevents it from causing trouble. Dicalite keeps the pitch particles separated, dispersed throughout the pulp. It coats them so they're no longer tacky, won't agglomerate into clumps, insulates them so they won't melt easily. When that is done, you don't get serious spotting in the finished sheet, or so many breaks on the machine. Also, wires and felts stay cleaner, and those frequent, time-wasting cleanups are reduced to a minimum.

In short, pitch control with Dicalite gives you a better sheet with less machine time and fewer headaches! Write for information on pitch control and the many other advantages of Dicalite in paper-making.

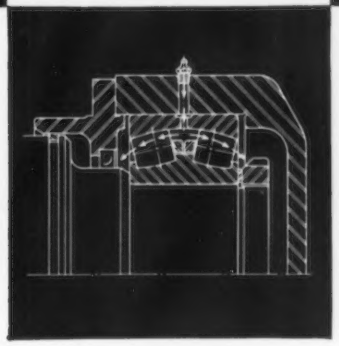
Dependable GLC GREAT LAKES

Dicalite DIATOMACEOUS MATERIALS

Dicalite Division / Great Lakes Carbon Corp. / 612 S. Flower / L. A. 17 / Calif.



The lubrication groove in the outer race eliminates the expense of machining a groove in the housing. With one simple center fitting, lubricant enters the bearing *between* the roller paths through three equally spaced holes. It moves laterally, lubricating all contact surfaces and flushing out the bearing.



A time-proved lubricating method now available on Torrington Spherical Roller Bearings

The circumferential groove in the outer race has met the test of experience in many Torrington Bearings, including Heavy Duty Needle Bearings, Aircraft Type Needle Bearings, Tapered and Radial Roller Bearings. Now the circumferential lubrication groove is available in Torrington Spherical Roller Bearings.

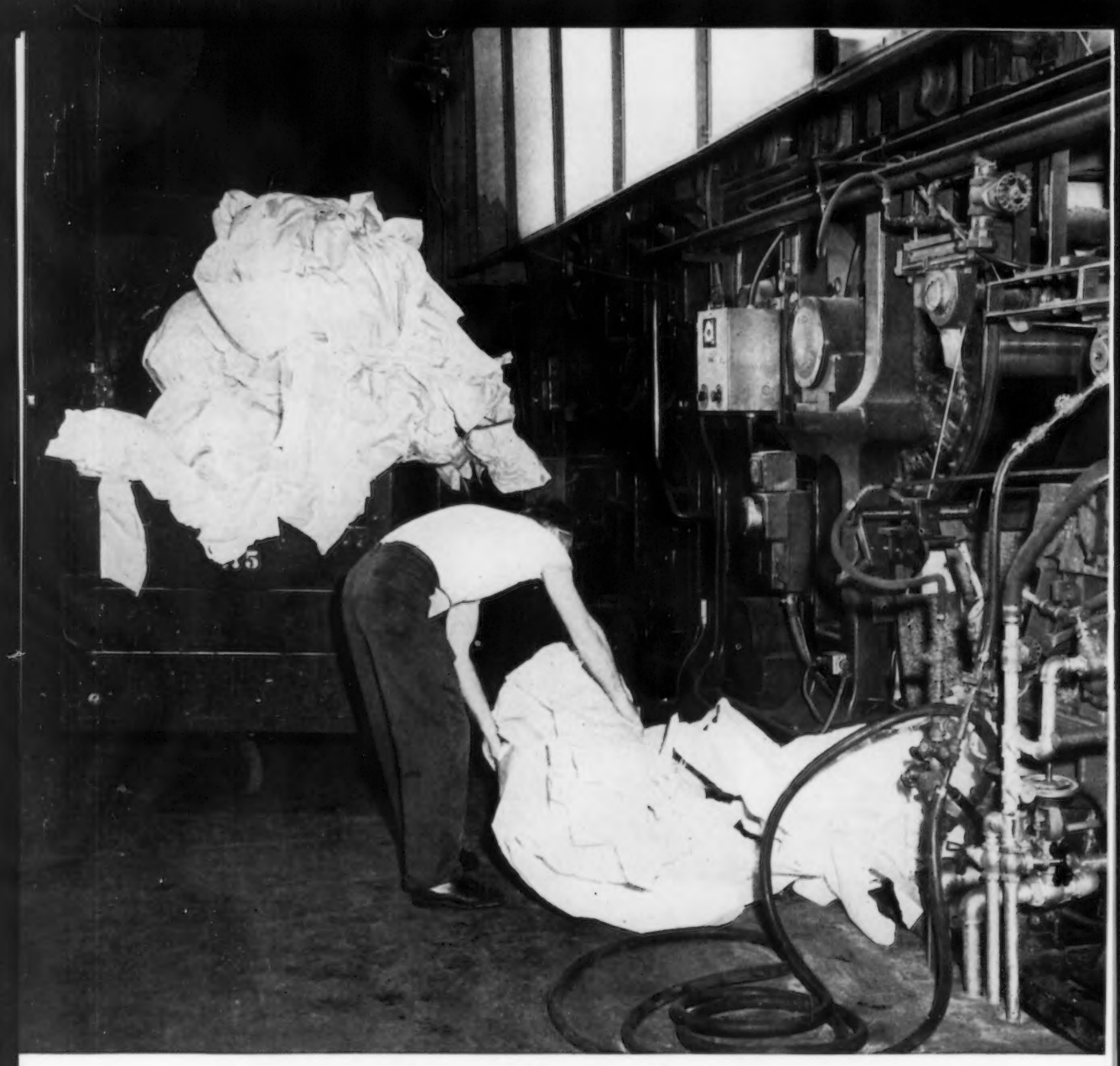
This design feature makes it possible to introduce lubricant *between* the roller paths without the expense of machining a groove in the housing. This groove is proportioned to provide generous lubricant flow capacity. Lubricant moves through the roller paths, flushing used lubricant and contaminants away from bearing contact surfaces.

Torrington Spherical Roller Bearings in many sizes may be ordered with this groove as desired at no additional cost. For further information, see your Torrington representative or write: **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST



you can reprocess the "broke"...
...but the time is lost forever

Back to the beaters goes the "broke" caused by a break in the paper web, and nothing is lost . . . nothing but TIME, that precious element of production. The time spent in carrying the paper making process to the point at which the break occurred, the time spent in clearing the machine, in cutting another tail and in correcting the cause of the break is lost . . . forever. The only cure for lost time is prevention, and a step in the right direction is standardization on Stowe-Woodward rubber covered rolls, developed and built by experts in increasing production and reducing paper machine down-time.

Complete roll processing plants at:
NEWTON UPPER FALLS, MASS.
NEENAH, WISCONSIN
GRIFFIN, GEORGIA

STOWE-WOODWARD, Inc.
Craftsmen in rubber
RUBBER ROLLS with a REPUTATION

Fall Business Moving Up

General business indicators show that September business was good. Retail and wholesale trade were ahead of the same month last year. Most types of industrial production were up slightly. Paperboard production was probably about even or slightly above September of last year, while paper lagged behind a bit. It is doubtful if demand for market pulp and container board will be sufficient to raise the operating rate of mills producing these to a high rate for the remainder of the year. Also there is still substantial new capacity coming in on these yet this fall.

Labor Contracts Still Unsettled

At this time of the year, all is usually quiet on the pulp and paper union contract front. By this time most contracts have been signed or at least such a definite pattern has been established that negotiations of remaining contracts are routine. This year it isn't so. There is still much wrangling over contracts at the converting plants and at the mills, with some strikes and narrowly averted strikes. In the near future we will endeavor to present a detailed picture of the contract negotiation pattern for this year.

July Pulp Production Off

Wood pulp production during July amounted to 1,597,300 tons as compared to 1,722,597 tons produced in July a year ago. Pulp inventories at the end of July at the paper and board mills amounted to 560,408 tons, as compared to 535,279 tons reported at the end of June. Month-end stocks at the pulp mills were 214,296 tons, as compared to the 222,245 tons reported at the end of June.

Pulp Imports Decline Variedly

Pulp imports for July were off 27%, and the year to date (seven months), off 12%. Imports from Canada were up 8% for July and off 3% for the year. Shipments from Europe were only 30% of last July and 31% for the year.

Our Industry Wage Leader

Our industry is a national wage leader, W. M. McFeely, industrial relations vice-president, Riegel Paper Corp. told the N. P. T. A. fall meeting. Mr. McFeely stated that in our industry, the average hourly wage received by the worker has risen over the past ten years by 84 cents—a 69% increase. This was compared to wages for workers in all manufacturing which increased only 75 cents over the same ten year period and wages in the non-durable goods field up 64 cents in the same ten years, 1947—1956.

Digester Lining Maintenance Discussed

Economical maintenance of the linings in the largest sulphite mill digesters has become a problem. A comprehensive article on this subject in the current issue presents some solutions.

A Rice Barton TRAILING KNIFE COATER Making Money . . .

Because it's less expensive to purchase — to install — to maintain.

Because it eliminates normal coating difficulties such as orange peel and turkey tracks.

Because it's producing *more, higher quality* coated paper faster than any other coating equipment available today.

RICE BARTON

RICE BARTON CORPORATION

Worcester, Massachusetts

Paper Machine Builders Since 1837

West Coast Distributor: **Ray Smythe . . 511 Park Building • Portland, Oregon**

Marathon Reorganizes Divisions

A long-range program to consolidate Marathon Corp. sales and manufacturing functions under single management heads is announced.

In line with this move toward decentralization of operating management activities, the company's existing central marketing and manufacturing divisions are being dissolved effective November 1. Personnel assigned to these areas will be transferred to the new operating divisions and to new central staff units organized to provide specialized services to the company as a whole.

As a first step toward such an organization, Leo E. Croy, until now head of the marketing division, has been elected senior vice president. He will aid in development of the new profit center concept of organization and will devote time to future planning and development of the company.

Over-all operations will be directed by Roy J. Sund, present head of the manufacturing division, who has been elected executive vice president of the company. All four new operating divisions and specialized staff services, except those in the financial and legal areas, will be under his jurisdiction.

One new operating division, to be responsible for the production and sale of Northern household products, will be headed by Milan Boex, Marathon vice president in charge of the present Northern sales division. This area will include production facilities of plants at Green Bay, Wis., and Menominee, Mich.

Frozen food, dairy and meat packaging operations will be directed by Donald A. Snyder, now vice president in charge of food packaging sales. Carton and food packaging plants at two Menasha locations and at Modesto, Calif., Sunnyside, Wash., Newnan, Ga., and Oswego, N. Y., will be under his jurisdiction.

A new pulp and paper division will be headed by Russell G. Flom, present director of pulp, paper and paperboard sales. This area will include production facilities at Rothschild, Wis., and the Oswego paperboard mill, plus operations of Marathon Corp. of Canada Ltd., company subsidiary. When Marathon's new pulp and paper mill at Naheola, Ala., begins operation, scheduled for early next year, facilities there also will be included in this division.

Stock products and bakery packaging activities will be directed by Palmer B. McConnell, now stock products sales manager. Plants at one Menasha location and at Ashland, Wausau and Neenah, Wis., are assigned to this division, which also will include paper cup production at Oswego.

In a move to intensify Marathon's "constant quest for new and improved products," Stevens announced that the company's research and development activities are being integrated into a single staff unit. This division will be headed by Ross C. Wilcox, now manager of central process engineering.

Consolidation of over-all marketing and manufacturing services resulted in the organization of two new central staff units. E. E. Den Dooven, present general production manager, will become manager of manufacturing staffs. Douglas G. Hyde, now head of central production services, will become manager of operations coordination and control.

Longlac to Kimberly-Clark

Longlac Pulp & Paper Co's. name has been changed to Kimberly-Clark Pulp & Paper Co. Longlac, which produces bleached kraft pulp at Terrace Bay, Ont., was built and operated as a wholly owned subsidiary of Kimberly-Clark.

H & D to Become Westvaco Division

The Hinde & Dauch Paper Co. of Ohio, a subsidiary of West Virginia Pulp & Paper Co. since it was acquired through an exchange of stock in 1953, is being merged as a major division of the parent company, effective September 30.

At a meeting on September 24 the board of directors of the parent company appointed Charles E. Frohman, president of H&D since 1951, as president of the division which will be known as the Hinde & Dauch Division of West Virginia Pulp & Paper Co.

Allied Delays Semi-Chem Mill

Allied Paper Corp. has announced postponement of its plans to build a semi-chemical pulp mill at Kalamazoo, Mich. A. H. Maremont, company chairman, stated that the capital intended for erection of the pulp mill has been expended in acquisition of other paper mills and converting plants.

New Stock System At Warren

S. D. Warren Co. is building a new four million dollar stock preparation system in a separate building at its Cumberland Mills, Maine, plant.

Consolidated Workers On Strike

The first production-stopping strike since employees of the Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., were organized in 1919 began September 19, when 1,200 members of the United Paper Makers and Paper Workers' Union set up picket lines at four mills at Wisconsin Rapids, Biron, Stevens Point and Whiting.

Some 2,900 other workers, electricians, pipefitters, machinists and pulp and sulphite workers, disregarded the picket lines. The four unions representing them had successfully negotiated agreements with the company. Paper machines, however, were not in operation at the four mills.

The only union to honor the lines was Office Employes' Local 95, a strike by which was averted by a new agreement September 8.

Employees of the firm's mill at Appleton were not involved in the strike, but it was announced the mill would close September 21 because of the walkout at the other mills. About 250 pulp and sulphite workers were idled by the Appleton shutdown.

L. J. Barrette, labor relations director for the firm, said no further negotiating sessions were immediately in prospect. The striking Paper Makers have been receiving a five per cent general wage increase, accepted by the other unions, since May 1, but apparently decided to negotiate separately for additional benefits.

Diamond Gardner Merger Action

A special meeting of stockholders of the Diamond Match Co. will be held on October 29, 1957, to vote on a company plan to acquire the assets and properties of the Gardner Board & Carton Co. of Middletown, Ohio, and to change the name of the company to Diamond Gardner Corp.

Paper Salesmen Assn. Meets in November

The Salesmen's Assn. of Paper & Allied Industries Inc. will hold a salesman-jobber meeting at the Belmont Plaza Hotel in New York City on November 15 and 16. The show will give wholesale paper salesman the opportunity to see new products and have questions answered by representatives of the manufacturers.

At a dinner meeting November 15, J. W. Hartung, chief purchasing agent for St. Regis Paper Co., will discuss do's and don'ts for the salesman from the purchasing agent's view, Milton Prager, credit manager for Trinity Bag & Co., will talk on the credit side of selling, and S. W. Franklin, vice president in charge of marketing for Atlantic Gummed Products, will discuss selling aids. Dinner tickets are priced at $9.50 and reservations must be made in advance. They may be obtained by writing John Meehan, Stevens & Thompson Paper Co., 1025 East 149 Street, Bronx, N. Y. or Irv Gordon, Lily Tulip Cup Co., 122 East 42 Street, New York, N. Y.

Paper and Board Production

According to the American Paper and Pulp Assn., the ratio of the United States production to mill capacity for the week ending September 14, 1957, was 90.0 per cent compared with 71.1 per cent revised for the preceding week. The ratio was 98.8 per cent for the corresponding week a year ago. Mills producing newsprint exclusively are not included.

The paperboard production ratio for the week ending September 14, 1957, was 98 per cent, compared with 72 per cent for the preceding week and 97 per cent for the corresponding week last year.

(Detailed statistics on page 46.)

"One thing about the boss—he knows his business—he's a paper man through and through!"

Bids Open for Proposed CZ-Time Mill

Bids for construction of a $31,000,000 paper mill for St. Francisville Paper near Baton Rouge, La., will be opened October 1 with contracts to be awarded and work started as quickly thereafter as possible. The mill will be jointly owned by Time Inc. and Crown Zellerbach.

Canadian Newsprint Figures Down for Aug.

Canadian newsprint production in August amounted to 560,285 tons, a decrease of 10,092 tons or 1.8 per cent from August 1956. Production per day averaged 20,563 tons, a decrease of 1.8 per cent from the daily average in August 1956. Production rate in August was 93.5 per cent of 1957 rated capacity versus 95.1 per cent last month. In August 1956 it was 104.1 per cent of 1956 rated capacity.

Canadian shipments in August were 524,045 tons, a decrease of 35,272 tons or 6.3 per cent from August 1956. Canadian shipments to U.S. consumers were 415,214 tons or 79.2 per cent of the total and 10.1 per cent lower than in August 1956.

U.S. production and shipment in August of 156,465 and 153,698 tons respectively showed increases of 1.4 per cent and .2 per cent over August 1956.

U.S. estimated consumption in August was 511,723 tons, a decrease of 21,380 tons or 4.0 per cent from August 1956. In August this year consumption was reduced by newspaper strikes in Boston and Detroit. About 72.3 per cent of total U. S. supply came from Canadian mills, about 24.8 per cent from U.S. mills and the remaining 2.9 per cent from others. Total U.S. supply in August was 574,259 tons compared with 637,230 tons in August 1956.

U.S. consumers' stocks increased by 62,536 tons in August to 1,156,399 tons, or 58 days' supply, compared with 901,592 tons, or 46 days' supply, at this time last year. Canadian and U.S. mills stocks increased by 36,240 and 2,767 tons respectively during the month. Total North American stocks at the end of August were 1,378,515 tons compared with 1,043,354 tons at the end of August 1956.

U.S. newspaper advertising (52 cities) in the first seven months of 1957 was 2.5 per cent lower than in the same months of 1956. U. S. magazine linage in the first seven months of 1957 was 1.7 per cent over 1956 and T.V. network billings were 6.3 per cent over 1956.

PAPER PEOPLE

Ralph M. Shaw

J. A. Kerr

Chosen President of MacMillan & Bloedel

Ralph M. Shaw has been appointed president of MacMillan & Bloedel Ltd., Vancouver, B.C., to succeed H. S. Berryman. Mr. Berryman has stepped down from the presidency on the advice of his physician, after serving the company for 29 years.

Mr. Shaw, who has been acting president for the past three months, has been directing for several years the company's marketing organization. He was in charge of the Export Section, Canadian Timber Control, during the war, subsequently returning to the company as export sales manager. He became general manager of sales in 1946, and in 1949 vice president in charge of sales, the position he held at the time of his current appointment.

Promoted by Bemis At Mobile Plant

J. A. Kerr, assistant sales manager of the Bemis Bro. Bag Co.'s multiwall paper bag plant in Mobile, Ala. has been named sales service manager. He replaces G. W. Finlay who has joined the St. Louis general office as supervisor of multiwall sales. Mr. Kerr joined Bemis in 1917.

Progresses at Biron Division

James Schad has been appointed assistant to the superintendent of paper machines at the Biron Division of Consolidated Water Power & Paper Co. A graduate of New York State College of Forestry, he joined the company in July 1955 following summer employment with the firm.

N. H. Anderson

L. C. King

Longview Fibre Advances Two

Longview Fibre Co., Longview, Wash., has promoted N. H. Anderson from purchasing agent to assistant to the mill manager. He will supervise purchasing and the Paper Order Department. L. C. King, formerly assistant purchasing agent, moves up to purchasing agent.

St. Regis Appointments In Mfg. Management

St. Regis Paper Co., has announced several appointments in its manufacturing management.

George J. Kneeland has been elected assistant vice president and will serve as assistant to Benton R. Cancell, executive vice president. Mr. Kneeland, who has served as production coordinator since 1954, will continue that function.

Walter H. Pollard, who has been serving the company as an independent consultant, has joined the company as consultant and will serve as assistant to Mr. Cancell.

John A. McDermott, who has been supervisor of all St. Regis paper mills, has been appointed general manager of all pulp and paper manufacturing. Mr. McDermott joined St. Regis in 1928 and served with St. Regis mills at Herrings and Oswego, N. Y. and Tacoma, Wash., until 1952 when he was transferred to the Jacksonville, Fla., mill.

U. J. Westbrook, who has been supervisor of all St. Regis pulp mills, has been appointed manager of kraft pulp and paper manufacturing. Mr. Westbrook joined St. Regis in 1941 at its Pensacola, Fla., mill, and later served as general superintendent there and as southern division production manager.

Per Berg-Johannessen

Named Plant Supt. at Dryden

Dryden Paper Co., Ltd., has promoted Per Berg-Johannessen, assistant pulpmill superintendent, to the position of bleach plant superintendent.

Mr. Berg-Johannessen has been in charge of the bleach plant since it started early this year. He was born in Norway, came to Canada after the war and attended the University of Toronto where he graduated as a chemical engineer in 1952. He commenced working for Dryden in the control laboratory and was promoted to assistant pulpmill superintendent early in 1956.

Edgar Eisenbraun

Allen Eisenbraun

Brothers Win Postgrad Scholarships

The Pulp and Paper Research Institute of Canada announces the award of the 1957-58 Visking Fellowship for Chemical Research to Edgar Eisenbraun, and together with McGill University, the award of the 1957-58 Gottesman Foundation Scholarship to his brother, Allen Eisenbraun. Both brothers are residents in Montreal while working toward their Ph.D. degrees at the Institute.

Edgar Eisenbraun was born in Germany in 1921. In 1945 he enrolled at the University of Bristol, receiving his B.Sc. in physics and chemistry in 1948. After working for five years as a plant chemist in England, he came to Canada in 1953.

Allen Eisenbraun was born in Poland in 1928. In 1947 he began studying chemistry at the University of Innsbruck, Austria, where he received his "Absolutorium" (equivalent to a Canadian B. Sc.). His studies at Innsbruck continued until 1952, at which point he came to Canada, joining the staff of Ogilvie Flour Mills Ltd., Montreal. He is presently on leave of absence from his company while completing his thesis work.

The Visking Ltd. Fellowship was donated to the Institute in 1952 by the Visking Corp. of Chicago, Ill.; the Gottesman Foundation annual scholarship was donated to the Institute in 1942 by the D. S. and R. H. Gottesman Foundation of New York.

Van Slambrouck Moves to Consolidated Design

Eugene Van Slambrouck has joined the Product Design and Development Department at the Ahdawagam Division of Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis. He has been employed by Consolidated in sales service work on folding cartons.

Miami U. Sorg Scholar Named

John D. Eichhorn, Miami University freshman from Middletown, Ohio, has been named as first recipient of the new "company family" scholarship of the Sorg Paper Co., Middletown, bringing to seven the number of students entering Miami's new course in papermaking techniques and chemistry with direct assistance from the industry.

He is the son of John A. Eichhorn, 1500 Oxford State Road, Middletown, veteran papermaking machine operator.

Six other job-related scholarships awarded cooperatively by Ohio's pulp and paper industry were reported in last week's *Paper Trade JOURNAL*. The combination of seven scholarships mean that half of the first-year participants in the program have entered on scholarships provided by the industry.

Dirk D. Young

New Hudson Dist. Manager

Dirk D. Young has been appointed district manager in the Multiwall Sales Department of Hudson Pulp & Paper Corp. He will cover the Iowa and Nebraska territory.

Brown Adds to Research Dept.

Issac R. Dunlap has joined the research and development department of Brown Co., Berlin, N. H. He will direct research and development of the company's Onco products.

Mr. Dunlap has been with Permacel Tape Corp. in New Brunswick, N. J. for the past nine years, working in the field of saturated papers. While with Permacel, he cooperated closely with members of Brown Co.'s research staff on programs carried out in the experimental paper mill at the research department.

Before joining Permacel, Mr. Dunlap was with the Continental Can Co. in Chicago and United Wallpaper at Aurora, Ill.

McClure Elected VP of Allied Paper

James McClure has been elected vice president of Allied Paper Corp., Chicago, in charge of manufacturing. He held a similar position with W. C. Ritchie & Co., Chicago paper converter.

Keegan Goes to O-I Mill, Multiwall Divs.

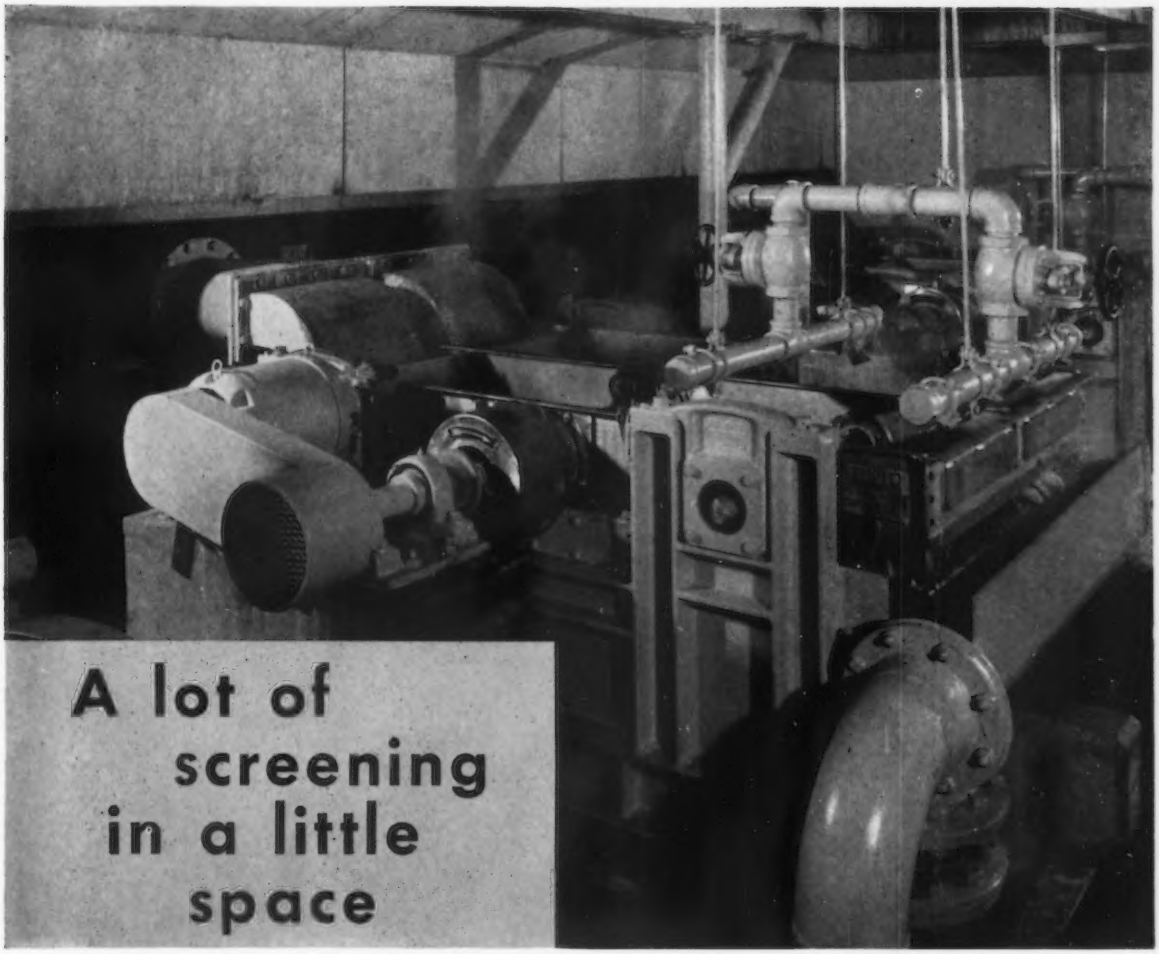
John C. Keegan has been promoted to staff assistant for personnel administration for the Mill and Multiwall Bag Divisions of Owens-Illinois Glass Co. and for National Container Corp.

He has been with National Container, an O-I subsidiary, since 1948, and will transfer to the company's general offices in Toledo, Ohio, in his new position. For the past year he has been assistant insurance manager at National Container's, Jacksonville, Fla. plant, and previously was personnel manager at the Valdosta, Ga. plant.

Sutherland Names Safety Engineer

Harold Wobbrock, formerly employed as a resident safety engineer for Employers Mutual Casualty Co. and prior to that safety engineer for the city of Gardenia, Calif., has been appointed safety engineer for Sutherland Paper Co., Kalamazoo, Mich. He will assist Safety-Medical Director Forest Kimmell.

Mr. Wobbrock will be responsible for keeping the supervisory staff informed of methods to promote safe working conditions and safe habits, including assisting in promotion of safety activities and performing safety inspections of the company's plants.



BIRD JONSSON SCREENS

Jonsson Screens employ high frequency, circular vibration to effect high, perforate plate screening efficiency plus capacity.

For instance, a Jonsson Screen with only 16 sq. ft. of screening area and ¼" holes puts through 100 tons of .95% consistency stock, equal to 1750 gpm. Power costs are only about .06 H.P. per ton.

Bird Jonsson Screens are virtually standard for removing knots and chips from black liquor ahead of brown stock washers. They are ideal for bull screening, knotting and tailings screening and for screening waste paper and deink stocks, straw stocks and stocks from refiners, defibrators and masonite guns.

Write for recommendations, layouts and estimates.

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

REGIONAL OFFICES: EVANSTON, ILLINOIS
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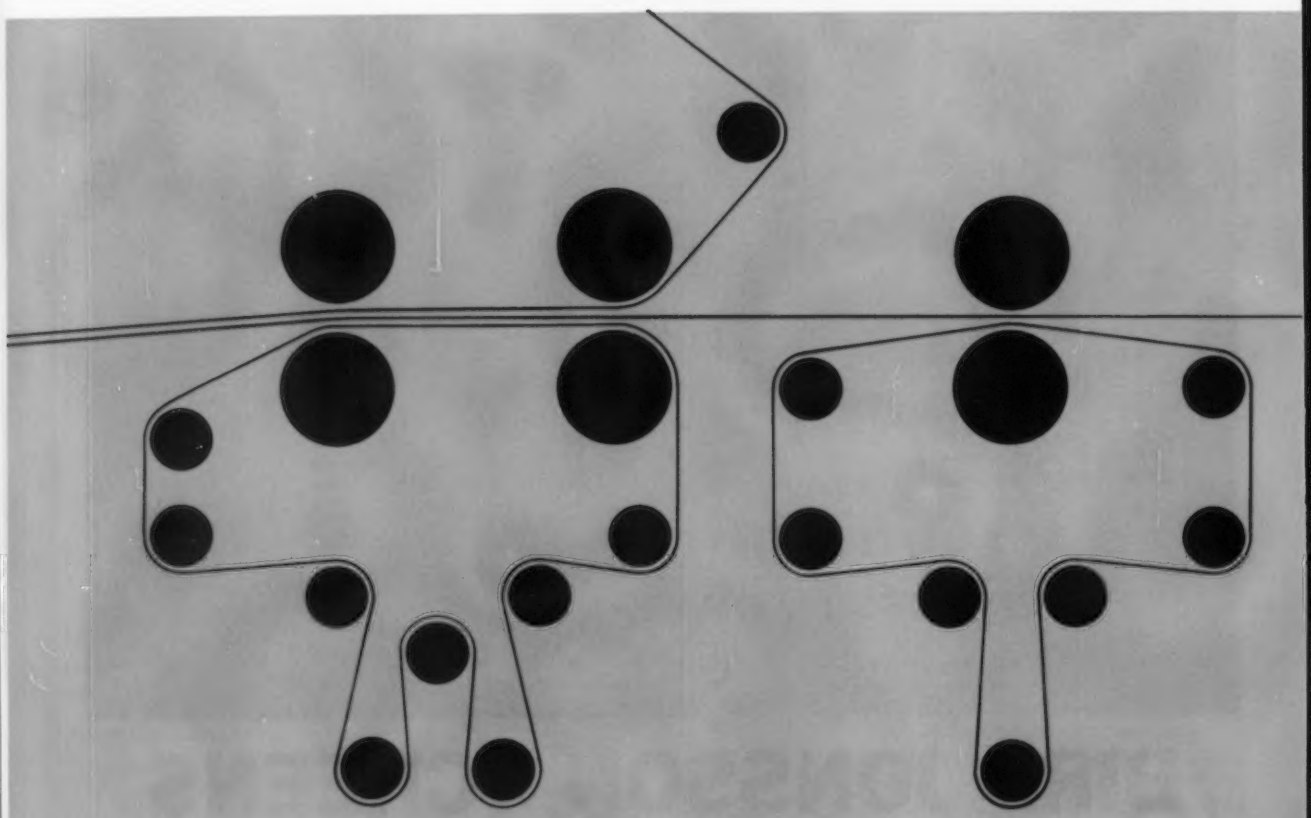
Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

A Record Any



FIRST PRESS

42 days

vs. 27 days for previous record.

SECOND PRESS

51 days

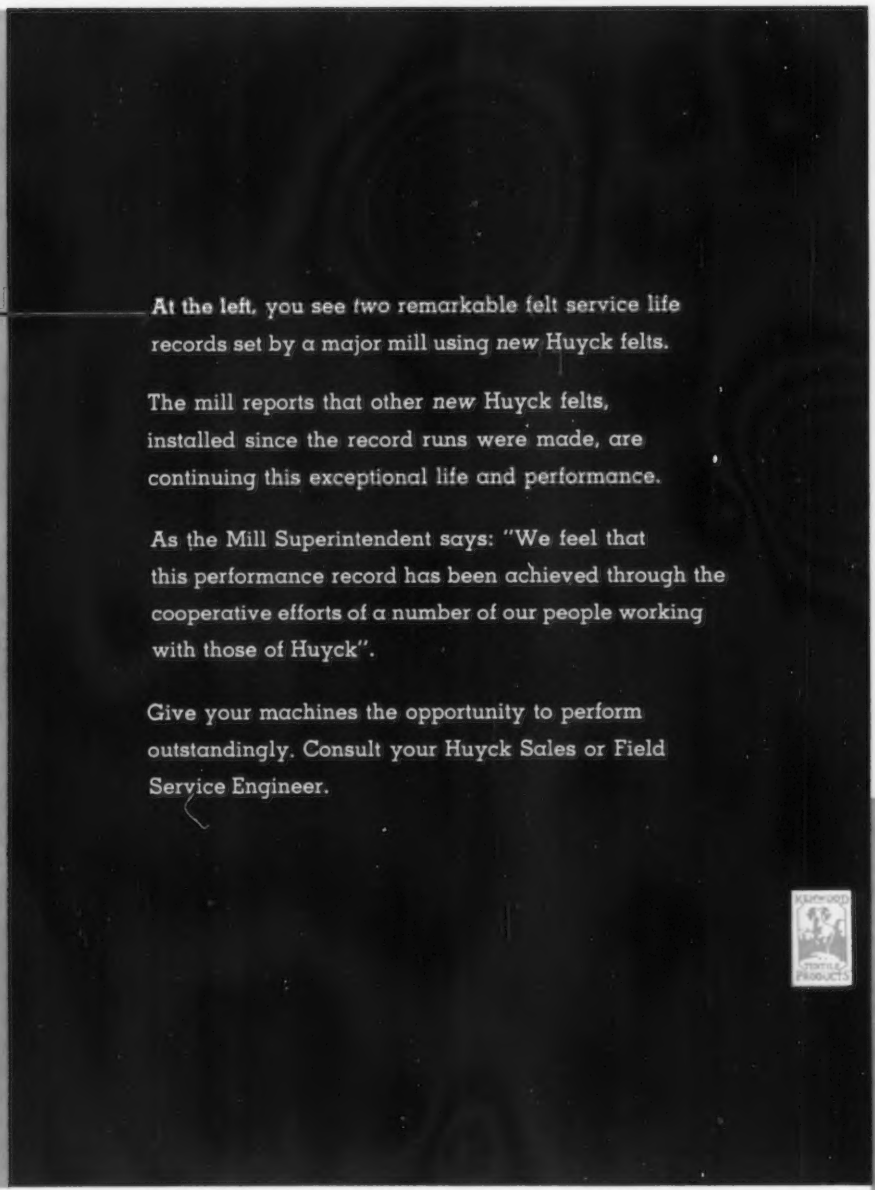
vs. 27 days for previous record.

Machine speed was in the 1,800 f. p. m. range with the first press felt passing through two press nips of approximately 300 lbs. per lineal inch.

FREE HANDY REFERENCE CHART

for determining width changes for cocked and bowed felts. Write for yours today.

Papermaker Would Like to Set...



At the left, you see *two* remarkable felt service life records set by a major mill using *new* Huyck felts.

The mill reports that other *new* Huyck felts, installed since the record runs were made, are continuing this exceptional life and performance.

As the Mill Superintendent says: "We feel that this performance record has been achieved through the cooperative efforts of a number of our people working with those of Huyck".

Give your machines the opportunity to perform outstandingly. Consult your Huyck Sales or Field Service Engineer.

F. C. Huyck & Sons.
Rensselaer, N.Y.:
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Kenwood Mills Ltd.,
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NEW HUYCK FELTS ☆ INDUSTRIAL FABRICS

FIRST IN QUALITY...FIRST IN SERVICE SINCE 1870

How to Increase Capacity of Cylinder Board Machines

Allen Lowe
Assistant Vice President
Sandy Hill Iron and Brass Works
Hudson Falls, N. Y.

Improved board quality and increased production may be obtained by alterations to or manipulation of vats, cylinders and stock flow conditions.

The increased demands of the package user for a box which will be a fine display piece on the store shelf has increased the need for a machine which will produce more and better box board.

Two ways exist to satisfy this demand: (1) purchase a new machine and (2) modernize an old one. Most mills have too much investment in an existing machine to take it out and completely replace it. Many mills, too, do not possess the capital to replace a machine. In these cases improvements in quality and speed can be made by the second method—modernization. This involves the use of the "bottleneck" scheme wherein the machine is analyzed and the particular section that is severely limiting production is replaced with improved equipment or supplemented with additional equipment.

Determining the Bottleneck

One of the most difficult parts of the machine to analyze or to change is the vat and flow combination. However, this is one of the most common bottlenecks and it is, therefore, worth the time and money required to improve the vat and flow combination.

No exact tests exist to determine if the vat and flow combination is a bottleneck. Therefore, this must be determined as a matter of judgment or by the process of elimination. That is, the operator tries to improve the performance of his machine by altering or analyzing such parts as the presses, the drying arrangements, the calender roll arrangements, the drive, and the reel. If after all this the machine still fails to produce better box board at improved rates of speed, the operator is reasonably certain that the fault lies in the vat and flow combination.

Here then are the various areas of the vat and flow combination which should be studied.

Cylinder Mold Diameter

There seems to be no unanimity of opinion among board makers regarding the ideal mold diameter. For example, one of the fastest machines making patent coated is running at more than 400 feet a minute and has a 42-inch diameter mold. Another high-speed machine is running the same type of board but with 48-inch diameter molds. Both apparently are satisfied with their product. Therefore, no one mold is the ideal—rather the mold diameter depends on the various operating conditions.

We subscribe to the theory that a stock of a certain freeness will form in that part of the circumference of the mold prior to the point where the formed mat restricts drainage. Some subsequent formation takes place but because of the flow through the circle-mold area such additional formation may not be good.

Therefore, it may be that a 42-inch mold provides as much effective forming area as does a 48-inch mold, and the 42-inch mold-circle area exposes the formed sheet to less disturbance.

However, as I have said, except by experimentation it is difficult to prove that any particular mold diameter in relation to the speed versus caliper problem is better than another and this then brings us into the area of "the judgment born of experience."

Circle Adjustment

One practical solution is a permanent circle with clearance probably in excess of the best condition. After a period of operation the circle can be lagged according to the operator's judgment.

Another solution is the use of a movable mold or a movable circle. Sandy Hill's movable cylinder mold was first installed about 1937. One experience with those which have been installed is much the same as what we hear about movable circle installations. That is, after a good average relation between mold and circle has been determined, further adjustment is seldom made—unless abnormal conditions are encountered. For example, changes in character and cost of stock related to profitable production might occur at long intervals, necessitating readjustment of the cylinder mold.

Another way to improve the cylinder mold operation is to substitute a four- or six-arm eliptical spider for the older candelabra type. This will eliminate the pumping action created by the multi-

arm resistance of the older type of spider.

The seal between the mold and the vat end can be a solid round section of polyvinylchloride. The sealing efficiency and longevity of this seal compensates for the operator's taking the trouble to learn how to keep it tight. The conventional strap type of seal requires a screw and handwheel to eliminate the slack which comes from wear. In the first few weeks of operation the polyvinylchloride solid rod type seal has to be shortened once or twice but this is a simple operation well worth the trouble.

Uniformity of Flow

The most important factor in the cylinder mold vat and flow combination is uniformity of flow across the machine on the incoming side, and—especially on direct flow vats—uniformity of overflow across the machine.

The best means of insuring the uniform distribution of fiber in the conveying water and uniform distribution of the whole flow across the machine is to discharge the fiber-bearing liquid into the area behind the making board or just below the distributor roll at not more than four feet a second. It is our experience that rates of flow in excess of this figure are likely to produce random currents, swirls and boils. These conditions, of course, prevent uniform delivery of the fiber bearing stream into the circle.

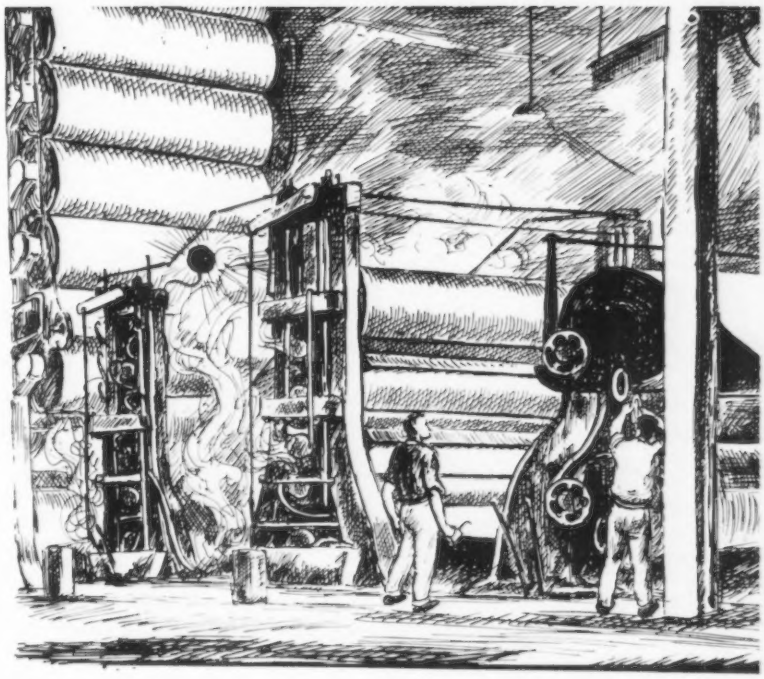
This may be done by either of two devices. One is a tapered rectangular spout, the other the multiple manifold of Sandy Hill Bertrams design.

The tapered rectangular spout maintains through all parts of the spout the same rate of flow and dampens the energy of the inflow speed if a pump-to-pump system is adopted.

The use of the spout designed to give a uniform speed of three to four feet per second, gives a very good distribution at the level of the making board or just below a distribution roll if one is used. The spout makes the transition between the rate of flow in the piping coming to the vat and a desirable rate of flow back of the making board.

Multiple Manifold

The very best device is the multiple-manifold. It delivers—at the rate of flow for which it is designed, say three to four feet per second—a flow into the area behind the making board that has no uncontrolled currents. The rate of flow at any point in the whole distributor is the same for any one gallonage. The distance from the single point of entry to each of the 32 points of discharge is exactly the same and the fiber borne by each of the divided streams is the same.



Our experience shows that the multiple-manifold is better than the spout because the spout is subject to unpredictable turbulences in the whole device and unpredictable concentrations of fiber in the whole flow and the multiple-manifold is not subject to these disadvantages.

A distributor roll located below the top of the making board (wing board) is a useful adjunct to the maintenance of distribution. Double wing boards—a short wing board mounted on the long wing board on each side of the center—are asked for by most operators. Moreover, operating experience has proved that a short floor (6 to 12 inches) just ahead of the making board contributes to the uniformity of distribution across the machine.

Vat Design

Overall design of the vat should provide for the greatly increased gallonage now used in the formation of board plies. It should be noted, however, that the design of vats is schematically the same regardless of whether they are intended for counterflow or directflow use. The only difference is in installation. Thus, if a papermaker wants to alter his flow arrangement he can do so by using the vats at hand and turning them end for end. A counterflow vat can be made overflow or not by the use of a dam which rises all the way to the top of the vat.

White Water Removal

In respect to the white water evacuation, a cylinder-sized discharge port eliminates the possibility of the flow restriction, which might occur in the boss type flow passage cast into the outermost wall of a vat. In addition, most vats are now provided with an air evacuation connection. A vacuum of upwards of five inches of water is possible inside the mold. This seems to be necessary somewhere above 350 feet per minute.

Refinements of design of the overflow compartment at the back of the mold have been only recently carefully considered. When the overflow is taken directly to the circulating pump or to a separate pump, the outflow pipe should be at the center. But when the overflow goes directly to the pump, it should be taken through a slot in the crossover extending the full width of the machine. This removes the possibility of a draw to one side of the vat.

Summary

In summary, every refinement as to flow control in every part of the vat should be utilized for uniform distribution of the liquid and for the greatest maintenance of the uniform mixture of the fibers in the liquid. These refinements—tempered by each papermaker's experience and operating situation—will help him produce more and better board.

New Concepts for Screw Press Design

M. E. Ginaven — Vice President, Machinery Sales
Albert H. Adams — Sales Engineer
Bauer Bros. Co., Springfield, Ohio

Theoretical considerations and design problems are discussed in connection with the development of a new screw press for pulp mill stock washing and fiber treatment. The new press is described in detail.

While the use of screw presses for pulp washing has been a recognized process for at least 40 years, it was not until four years ago that achievements beyond the simple dewatering of fibers were realized. It is now well established that the screw press has a unique fiberizing technique for refining wood chips and agricultural residues and has made feasible a new high yield pulping process.

Because screw presses have been used for a wide range of applications in process industries, the design features are quite different, and no single design of screw press is likely to do a broad range of fluid expression jobs efficiently. The early commercial machines were used for pressing oil from seeds, nuts and fatty animal tissues, and design protection dates back to 1849 when an English inventor received a patent on a screw press. Other British and German designed screw presses were patented prior to 1900, which is about the time that screw presses manufactured in the United States became available.

A commercially successful application of high pressure screw presses was made at the Green Bay Paper and Pulp Co. in April, 1953. This initial installation of four machines established a new procedure for the production of N.S.S.C. pulp for nine-points, and within the past three years over 20 other installations, totaling approximately 40 Pressafiners have been made.

From our initial exploratory work, with wood chips and bagasse, conducted in late 1952, we recognized that three basic achievements are possible with the continuous screw press. These are:

1—The extraction of liquids from wood or agricultural residues.

2—A unique primary fiberizing action, produced by squeezing and rolling fiber bundles under intermittent, controllable pressures.

3—A mild steaming or vapor phase heating effect on the material being treated with intimate contact on fiber bundles.

In addition to these three basic accomplishments, commercial pulp mill operation of screw presses revealed at least ten minor benefits in processing high yield pulps. Most of these were not anticipated. In fact, a basic research program was promptly instituted to further study the variables in these benefits with the hope that commercial operations could be reasonably well forecast from laboratory evaluations of materials to be processed, and that such commercial operations would be consistent and dependable.

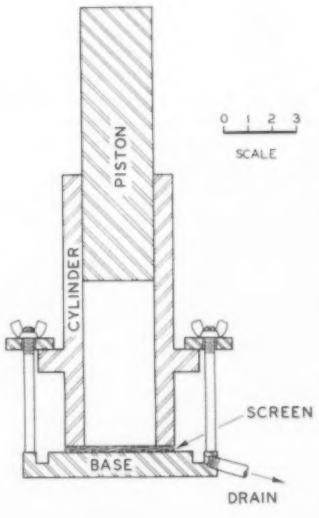


Figure 1—Laboratory batch pressing apparatus.

At the Fifth Annual Pulp and Paper Conference at the University of Florida, we reported on our Pressafiner development program by listing the commercial achievements of some of these machines, and also pointed out mechanical limitations of the equipment offered at that time[1]. Concurrently, we were engaged in a broad laboratory study of pressing fundamentals, and a basic evaluation of mechanical designs. We concluded our background studies with these eight requirements for a screw press to merit commercial acceptance by pulp processors:

1—Basic design must follow theoretically sound principles of extraction and fiberizing, which can be verified by laboratory evaluations.

2—The machine must be of utmost simplicity in design and assembly, with good accessibility for maintenance purposes.

3—It must have extreme ruggedness in construction.

4—The design must provide for complete safety of the operating and servicing personnel.

5—The best available abrasion and corrosion resisting materials should be

This paper refers to continuous screw presses manufactured by Bauer Bros. Co. and recognized commercially as the "Pressafiner" and "Impressafiner".

[1]"Progress Report on the Pressafiner for Pressure Washing and Fiberizing" by M. E. Ginaven and A. H. Adams, Paper Trade Journal, January 28, 1957.

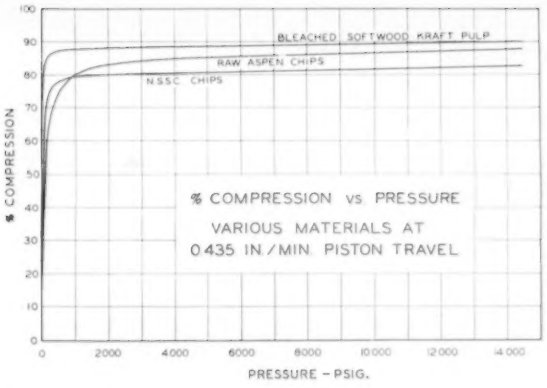


Figure 2—Per cent compression vs. pressure for various materials.

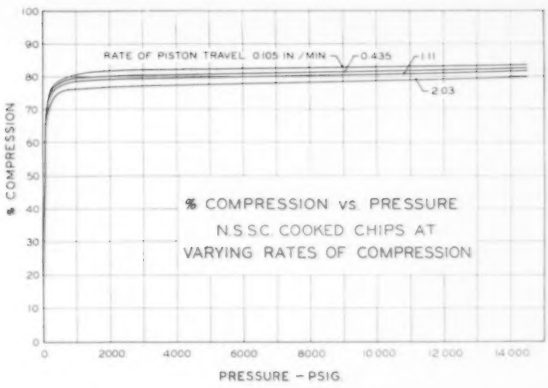


Figure 3—Per cent compression vs. pressure for semi-chemical chips.

used wherever fiber, liquors or vapors contact the machine parts.

6—Adequate protection against serious damage to equipment by foreign matter should be provided.

7—The rotating parts of the machine must be continuously supplied with filtered oil and fully sealed against liquor and dirt.

8—The machine capacity should be adequate to handle any commercial requirement with a reasonable number of units. The objective for 75 per cent yield N.S.S.C. chips is 100 a.d. tons per day, with power consumption up to 2 hp. days per ton.

Basic Research Work

To explore the fundamental phenomena of chip and fiber pressing, a simple, batch-type press was set up in our Fiber Products Laboratory. This equipment, designed and assembled by Edwin V. Kemp,[1] consisted of a cylinder and piston arrangement with a suitable drainage screen and spout, as shown in Figure 1. The device was mounted on a metallurgical laboratory Riehle Beam Tester to provide means of applying measurable loads.

Information obtained with this equipment indicates that frictional and compressability characteristics of the material to be processed are of basic importance in press performance. These two items, along with the mechanical efficiency of the press drive, and the electrical efficiency of the driving unit, comprise the controlling factors which determine the power required for any given operation.

As would be expected, the loading required per unit of compression becomes greater as compression ratios increase. This is shown graphically in Figure 2.

This graph also shows variation in load required to compress different materials. These data establish the need for design features that will permit variation in compression ratios for different feed materials, and balancing of compression throughout the press for any given feed to distribute loading on the main shaft and provide proper feeding characteristics.

Batch pressing tests made at different loading rates (as plotted in Figure 3) also show that the loading required to obtain a given compression increases as the loading rate increases. This emphasizes the importance of uniform and gradual increases in compression and was a factor in engineering the overall dimensions of the new press.

Figure 4 shows schematically how compression ratios were balanced throughout the first machine to provide for uniformly increasing increments of compression.

In addition to developing information useful in designing for uniformly increasing increments of compression, the batch pressing tests and theoretical calculations provide some knowledge of the relationship between compression ratio and solids content of the compressed material. With this information and the plot of per cent compression along the Pressafiner shaft, the change in solids content and amount of liquor removed as the material is compressed can be predicted.

Figure 5 shows the relationship between per cent compression and solids content after pressing with various feed consistencies. These data were derived from calculations based upon the compression ratios shown in Figure 4 and analysis of liquor removed from the N.S.S.C. chips used for batch pressing tests. This material was used because the prototype machine was intended to press commercially cooked N.S.S.C. chips.

The accuracy of these calculations is shown in Figure 6 where the calculated curve for a 42 percent o.d. feed material is plotted along with points obtained in laboratory batch pressing tests. Results of commercial operation obtained after the No. 560 Pressafiner had been completed and put into operation, are also included on this graph.

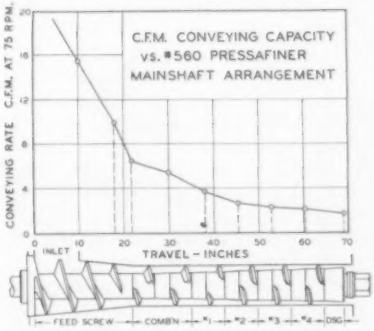


Figure 4—Conveying capacity vs. the mainshaft arrangement.

Mechanical Design Program

While the laboratory program served as an excellent guide to the establishment of proper compression ratios and drainage areas, the translation of ideas into commercial equipment was the major problem. As outlined in our set of specifications, the machine would be basically unlike any existing screw press, built in this country or abroad, and would require considerable pioneering in design and metalurgy. Preliminary basic ideas for the equipment were submitted to John L. Ostborg[2] for stress

1. Assistant Director Research—Fiber Products Laboratory, Springfield, Ohio.

2. President—Ostborg and Associates, Springfield, Ohio.

studies, and arrangement of major components. Final design and detailing of all parts was a cooperative effort with the Bauer Bros. Co. engineering staff participating.

Referring to the sectional drawing, Figure 7, of the new machine (Bauer No. 560), we briefly summarize the mechanical features.

To achieve simplicity, we designed a base member capable of carrying all longitudinal stresses in a unit weldment. No tie rods, external braces, or loose pieces are employed. The entire interior of the base is made of No. 316 stainless steel. The exterior and gear housing is finished with a hot-sprayed plastic coating. The clean design of the base interior makes possible the unimpeded gravity flow of liquors containing high amounts of chemical solids from either side, or both sides of the machine.

The solid stainless steel feed and main cages are split on the horizontal centerline. This provides maximum access to shaft assembly, and screen bars, and permits a quick and extremely safe removal of parts for service. A hoist, and pneumatic impact wrench (for cage bolts) can be readily suspended above the cage area.

The shaft assembly of the No. 560 Pressafiner is unique in two features. First, the initial compaction and removal of voids in the chips or other materials being fed, is accomplished by a truncated conical feed worm (patent applied for), operated at the same speed as the main shaft assembly. Flight pitch variations permit initial displacement ratios with the main shaft in the range of 1.5 to 1 up to 3.6 to 1, which were the limits of ratios established by laboratory compression tests for several commercial materials.

This concept of design makes it feasible to use a single shaft, and a single gear train. There are also other advantages, as the great flight depth at the large end and of the feed worm makes for easy feeding of large pieces and for consistency stocks. A counter-rotating pair of feed screws (patent applied for) lightly compress incoming materials into the conical feed worm, but only on the downward moving side of the worm.

While the conical cage section posed some design and production problems, the results achieved have more than justified the solutions of the manufacturing requirements. The design offers excellent drainage advantages over conventional screw presses, and permits extraction to equivelent levels of dryness with far less power input.

A second advantage of the new design is the complete interchangeability of all shaft collars and worms. This provides for maximum flexibility in extraction, with a minimum number of parts.

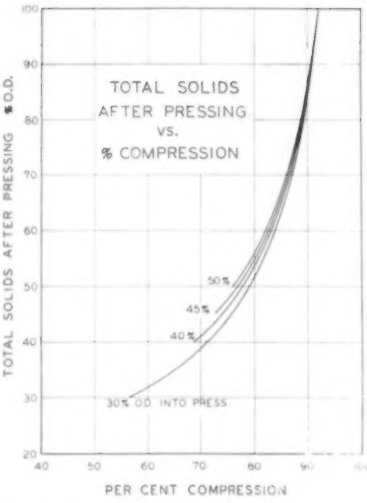


Figure 5—Total solids after pressing vs. per cent compression (Calculated).

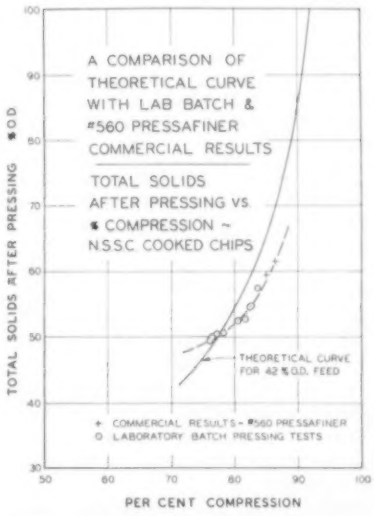


Figure 6—Total solids after pressing vs. per cent compression (Actual).

It should be pointed out that final extraction control is made by various diameters of discharge sleeves which are interchangeable without dismantling the press (patent applied for). We have found from experimental work in our laboratory and in field tests in four mills, that this control is more effective than an adjustable cone, and uses substantially less power to do the same job of liquor extraction. The No. 560 Pressafiner includes a discharge elbow with weighted inspection door (for samples, etc.) to confine the pressed material for cleanliness and safety.

To remove a shaft from the No. 560 Pressafiner requires only 18 inches of space in front of the press.

Twin screw feeders are interchangeable with conventional feeders. Both have Triple Air-Gap permanent magnets built-in.

Standard foot type motors (TEFC or splash-proof design) are used for either direct connection via flexible coupling, or by pulp-vee belt drive.

All parts have been generously "overdesigned." The gear train is capable of four times the motor load. The shaft is solid heat-treated stainless steel. Feed cage, main cage and all screw parts are also solid stainless steel. Feeder body, feed control screws, and twin screws are stainless fabrications. The base interior is stainless steel, and liquor discharge pipes (remote from gearbox) are four-inch stainless flanged pipes.

The gear box is well sealed against ingress of liquor, or dirt. Lubrication is by forced-oil, and the pump is driven by the main gear for positive lubrication of filtered oil through jets to all bearings, and the gear and pinion.

Careful consideration has been given to maintenance of the machine. All parts are as simple as the utility permits and designed for ease and safety in removal and replacement. Access doors of ample size are provided, and lightweight stainless covers enclose the extraction end of the machine.

Only the top half of the main cage needs to be removed for bar changes. The lower half is at work-bench-height and normally is not removed from the base.

The entire top half of the gear box is removable. Oil flow to all bearings and gears is readily observed through flow-gauges. Filter cartridges are easily changed.

Effort has been made to utilize the best materials for basic construction, and where abrasion is encountered the parts have been given protective overlays of stellite, or other wear resisting alloys. From feeder to outlet spout, all contacted parts for pulp, expressed liquors, or vapors are of stainless steel, or corrosion and wear resisting alloys.

An exterior view of the completed machine is shown in Figure 8.

Commercial Operation

The prototype No. 560 Pressafiner was installed at the Otsego Falls Paper Mills, Otsego, Mich., in early March of this year. This mill was selected because the operating staff was aggressively research-minded and their N.S.S.C. cooked chips were both abrasive and corrosive, providing an excellent test for the materials used in constructing the press. Furthermore, they have in this plant, two earlier models of screw presses, which afforded an opportunity

to make direct comparisons of performance on a day to day, or cook to cook, basis.

The daily production of pressed pulp from the No. 560 Pressafiner is in the range of 90 to 110 a.d. tons when the usual 56-57 per cent moisture N.S.S.C. chips are processed. Capacity of the machine can readily be varied from one-quarter to full load of the 200 hp. motor without affecting the normal steady discharge of pressed material.

Fiberizing is controllable within practical limits by adjustment of main shaft arrangement and through the use of special design "wave-line" (patent applied for) screen bars. The shredding action being achieved on the new machine has exceeded that done by previously observed screw presses, and this feature appears especially desirable for the processing of 85 to 95 per cent yield, pulps, and full yield shredded furnishes for dry process hard boards.

Power requirements for the new machine are lower for equivalent amounts of extraction than was recorded for earlier types of screw presses. The average power input is 1.7 hp., days per a.d. ton when pressing to 60 per cent total solids. At 50 per cent total solids pressing the power input drops to around 1.3 hp. days per ton. A 200 hp. poly-vee drive is used on this experimental machine and thus far transmission has been entirely satisfactory.

Experiments have been conducted to evaluate the hydraulic capacity of the machine, and while we have no commercial experience on low consistency pulp pressing, the indications are that the very high ratios of drainage area, compared to conventional screw presses, are definitely beneficial in processing "wet" chips, screenings, and pulp.

Conclusions

The foregoing brief presentation of operating data, based on more than five months of six 24-hour-days per week, reveals substantial proof that the dependability, capacity and extraction objectives of our program were achieved.

Secondly, three scheduled dismantlings of the machine were made to check parts for wear, corrosion and distortion. The examination of these parts indicate that their life will be commercially satisfactory.

It was observed that the closer we approximated the laboratory displacement-pressure curve for given materials, the more efficient the Pressafiner performance became. This limited experience, checks laboratory forecasts that for fluid extraction pressure should be applied as gradually as is feasible in reaching the desired moisture level. Comparison of laboratory batch pressing test data and commercial results indicates that the laboratory set-up will be useful to obtain preliminary information for planning test runs on the No. 560 Pressafiner in our laboratory. However, there appears to be no correlation between extraction pressures and the extent of fiberizing. Fiberizing can be controlled somewhat independently by main shaft assembly and screen bar design.

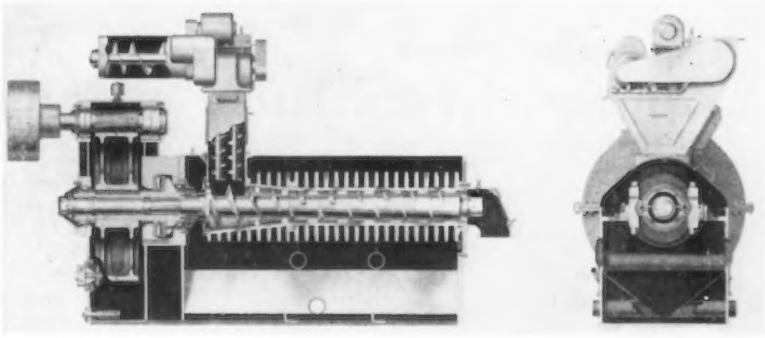


Figure 7—Sectional drawing of No. 560, the new Pressafiner.

Comments made by the operating and maintenance groups servicing the first No. 560 Pressafiner, confirm that the major mechanical design goals have also been reached. The equipment can be dismantled with power tools in far less time than was required for earlier designed screw presses, and the mechanics report that the design of parts permits easy handling in a completely safe manner.

The sealing of expressed liquors from entering the gear case has been effectively accomplished, and the use of filtered forced oil to gears and bearings has had the endorsement of the service group. A quick inspection of the bank of eight oil flow gauges indicates lubricating condition at all times, and an audio low oil pressure signal provides adequate safety should the lubricating system pressure fall below the established minimum.

The successful development of the new No. 560 Pressafiner in a relatively short time was a result of integrated team work, and the authors of this paper gratefully acknowledge the excellent cooperation of John L. Osborg and Associates, Otsego Falls Paper Mills, Green Bay Paper and Pulp Co., Ohio Steel Foundry Co., United Welding Co., Bornell Supply Co., Recknagel Machine Products Co. and the equipment suppliers who participated in this project.

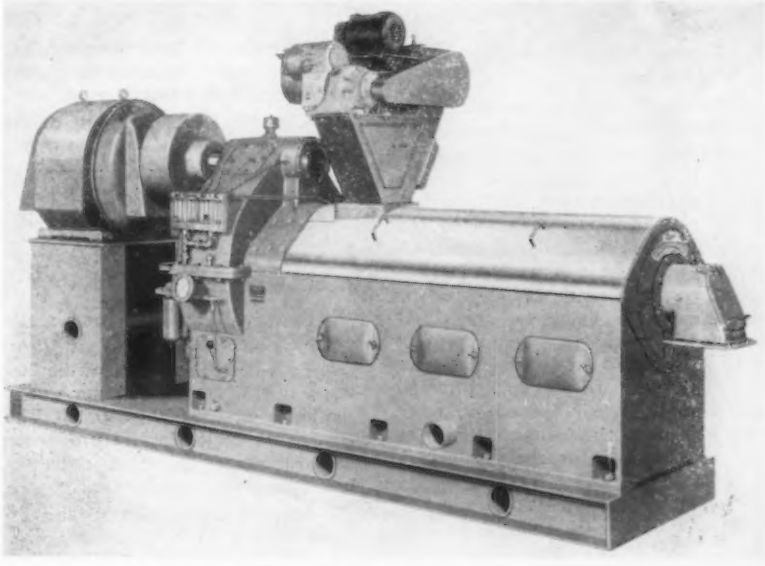


Figure 8—Exterior view of the new Pressafiner.

Comparative Study of Linings for Sulphite Digesters

J. M. Jopp
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Prince Rupert, B. C., Canada

At the beginning I wish to emphasize and draw particular attention to the following statement:

The decisions reached are the result of comparative studies. It is highly unlikely that any type of digester will operate for a long period without maintenance. However, the evidence strongly indicates that a stainless-clad vessel of the specifications and design contained herein will produce higher quality and lower cost sulphite dissolving pulps than any of the other three alternatives.

A company about to purchase a new sulphite digester has at least four types of vessels from which to make a choice:

I—Riveted or welded steel with ceramic brick lining.

II—Riveted or welded steel with carbon brick lining.

III—Riveted or welded steel with alloy steel lining.

IV—Stainless steel clad vessels.

1—Carbon Steel Ceramic Brick-Lined

The earlier sulphite digesters were rivitted construction, the heavy butt straps acted as reinforcement, and resulted in a very rigid design. If some out-of-roundness existed, the distortion under pressure was minimized by the stiffening effect of the butt straps to a degree where the concrete grout held securely, and a lining life of nine or ten years for face linings was considered normal and many gave longer service.

With the trend toward larger diameters (up to 19 ft.) and higher design pressures, a riveted vessel is more costly to construct. A logical step is to use a welded construction and high tensile steels. Such a design meets the code requirements, but another factor becomes of paramount importance; the thinner wall sections do not have the necessary beam action strength to resist distortion under pressure when out-of-roundness exists. Portland cement mortars fail under low tensile stresses, and in several large digesters thus constructed the original linings have lasted only one to nine months. In order to make these vessels serviceable, very costly design changes were made to stiffen up the shell. The digesters have continued in operation, but subsequent linings are not giving normal service. At least five 19-x-16-foot digesters that I am familiar with are not likely to exceed six years for the second face linings, and two of them will probably require complete linings within that period.

The advantages of this type of vessel are:

1—Ceramic brick has been a standard for many years, and maintenance methods are well known.

2—The initial cost is lowest of the four types.

3—Maintenance requires no unusual skills or materials.

4—Until recent years, there has been no alternative.

Several disadvantages are:

1—Continual inspection and minor repairs are necessary.

2—Periodic replacements of the face course, at $15,000—$20,000, or a complete lining, at $25,000—$30,000. This excludes the major loss in production which accompanies these re-linings. These figures will vary from mill to mill.

3—Even minor repairs require extended cooling periods, sometimes as long as four hours, before the temperature is low enough for men to work in safety.

4—Up to 18 per cent of the digester volume is occupied by the lining.

5—There is continual introduction of refractory grit and dirt to the pulp system due to erosion and spalling (0.3 cubic feet per day for Columbia Cellulose digesters).

6—The rough surface holds up dirt and scale which sloughs off in batches.

7—Digester nozzles and strainers are expensive and difficult to maintain.

8—There have been serious, unexplained failures with soluble bases.

Going on to the next class of digesters, we will discuss:

2—Carbon Brick-Lined Vessels

The discussion with reference to ceramic brick also applies to the use of carbon brick. The same inherent weaknesses are present, and since we know of no North American installations in operation to use comparatively, we must rely on the experiences of European mills. Many of the mills we visited are experiencing less maintenance with carbon brick, although these mills have only used them about four years.

The known advantages are:

1—In Europe, lower maintenance and longer life than with ceramic brick.

2—Carbon brick may be superior to ceramic with soluble base acids.

3—Maintenance requires no special skills or materials.

The disadvantages are:

1—Experience on sulphite in North America has not been satisfactory. The difference may lie in superior European materials, and/or less drastic conditions. Until this is clarified, installations here must be considered as experiments which might become very costly.

2—Frequent inspection and minor repairs are still necessary.

3—Several hours are necessary for cooling down the digester sufficiently

Paper presented at the 1957 Spring Convention of the Pacific Coast Branch, Technical Section, Canadian Pulp and Paper Assn., held at Harrison Hot Springs, B. C., April 25, 26, 27, and also presented at the Summer Meeting of the Technical Section, Canadian Pulp and Paper Assn., held at Saranac Inn, N. Y., June 5, 6, 7, 1957.

to permit workmen to enter and make repairs.

4—Up to 15 per cent of the digester volume is occupied by lining.

5—There is a continual introduction of dirt into the pulp, due to erosion and spalling.

6—The rough surface catches and holds dirt which can slough off in batches.

7—Digester nozzles and strainers are expensive and difficult to maintain.

The next classification is:

III—Stainless Steel Lining

This heading covers any form of stainless steel lining which is attached or installed in the digester, and which is not included in the design of the digester as a pressure vessel.

The advantages are:

1—A given shell size contains more useful volume and produces more pulp than a brick lined digester of the same outside diameter.

2—Susceptibility to thermal shock is low compared to a brick lining resulting in:

(a) Less down-time for repairs.
(b) No break-in period.
(c) Ability to minimize scales by washing between cooks.

3—Freedom from dirt.

4—The smooth surface permits more uniform chip packing and liquor circulation.

5—The smooth surface and better chip packing permit more production per digester.

6—Nozzle fittings are readily installed and maintained.

7—The major expense of relining is eliminated.

8—Any acid base may be used.

The disadvantages are:

1—The initial cost is relatively high.

2—This type is not well adapted to a heating-cooling cycle because of differential thermal expansion and the work-hardening characteristic of stainless steel.

3—Chlorides introduced by salt-water-borne wood are considered deleterious to some stainless steels, although our No. 6 and others have shown no appreciable ill effects.

4—The level of skill and care in fabrication and maintenance must be very high.

5—This type of lining may no longer be available from the company which installed the No. 6 at Prince Rupert.

IV—Stainless Steel-Clad Vessels

This classification consists of carbon steel upon which stainless steel sheets have been bonded by rolling at elevated temperatures in the steel mill.

The advantages are:

1—The useful volume in a given shell is higher than brick lined, and equivalent to stainless lined.

2—The strong continuous bond between shell and cladding eliminates differential expansion and work-hardening. Stress corrosion is minimized.

3—A very smooth and uniform surface is obtained. This inhibits scale formation which is a known promoter of corrosion.

4—Less susceptibility to thermal shock than other types of digesters, resulting in:

(a) Less down-time for repairs.
(b) No break-in period.
(c) Ability to wash with cold water between cooks to prevent scale.

5—The smooth surface permits more uniform chip packing and liquor circulation.

6—The smooth surface and better chip packing permits more production per digester.

7—Nozzle fittings and strainers are readily installed and maintained.

8—Any acid base may be used.

9—Under present market conditions, delivery is shortest of all alternatives.

The disadvantages are:

1—The initial cost is relatively high.

2—Fabrication requires a high degree of skill and precision.

3—Chloride corrosion is a possible factor, though it should be less than with stainless lining because of greater uniformity and less stress in the stainless cladding.

GENERAL DISCUSSION

Ceramic Brick Linings

1—Digester lining life expectancy, North American mills:

The larger diameter vessels are likely to be more out-of-round and subject to greater distortion under pressure, hence vessel size may be a factor affecting the lining life.

The 1954 report by the Sulphite Committee, Technical Section, Canadian Pulp & Paper Assn., gave information on 136 digesters with double-course linings. The average lining life was found to be 9.3 years, but if only 18 foot and 19 foot diameter vessels are considered, the figure will be much lower. Further information has been obtained on a number of 18 foot and 19 foot installations, and is reported in Table I.

The figures in Table I indicate that with 18 foot and 19 foot digesters, the average lining will last less than seven years, and with soluble-base acids, even though special materials are used, the average for all vessels in such service is much lower.

2—Maintenance Costs:

DIRECT COSTS, MATERIAL & LABOR:

In the Prince Rupert mill of Columbia Cellulose Co., maintenance costs have been kept on the five brick-lined 19 foot O.D. digesters from September, 1955 until December, 1956. The average for the 15 month period is $5,080 per digester. These linings have been in service less than five years.

INDIRECT COST:

For the same period the out-of-service time has averaged 75 hours per vessel, or equivalent to 165 tons of lost production. Records from some European mills indicate costs in line with those at Columbia Cellulose.

Carbon Brick Linings

EUROPE:

Rauma-Repola, Finland:

Sodium base two-phase cooks. Their experience with carbon brick in five digesters has been more satisfactory than with the former ceramic linings.

Uddeholms, Skoghall, Sweden:

Calcium base. Seven digesters in service 1½ years with no maintenance.

TABLE I—CALCIUM BASE

Mill	Diameter	Type of Lining	Lining Life in Years
A	18'	Double	7
B	18'	Double	5
C	18'	Double	10 (long cooks)
D	18'	Double	6
E	19'	Double	6½
F	19'	Double	6
G			Average of 7 years for the last 22 linings.
Soluble Base:			
H	17'	—	Six digesters; in period of 2 years some relined and major repairs to others.
I	—	—	Four digesters, all relined within 18 months.

Attisholz, Switzerland:

Calcium base. Five digesters ranging up to five years in service. 300-man-hours per year maintenance to date.

Ehingen, Germany:

Calcium base cooking, 100 per cent hardwood. One carbon-lined vessel has required an average of 500 man-hours per year for maintenance.

A report of the Cellulose Chemistry Society, Technical Committee for Digesters, October 3, 1953, Neustad, Germany: Dr. Haas, chairman, reports as follows: "There is certainly no question the triumphal career of carbon bricks can no longer be sustained." This quotation was followed by member discussions relating to difficulties experienced by a number of mills.

North America:

Experience in this country has been limited, and I have no knowledge of any successful carbon brick installations. The reason is not known, but may be due to the difference in carbon bricks and the more severe cooking conditions here.

Stainless Steel Linings

The use of intermittently attached stainless steel linings for sulphite digesters generally has been limited to North America. Stainless steel linings of a loose or bag type have been used for about seven years in Europe, and recently two digester domes have been done in America. Following the war one American company developed a design for an intermittently attached lining and sponsored its use in several mills. The first digester thus lined that we know of was in 1950-51, and later two other mills installed six and one of a similar design.

The first linings were Type 316, but serious corrosion occurred in the domes, and later linings included Hastelloy F for these sections.

The Prince Rupert mill of Columbia Cellulose has one 17 foot 9 inch x 60 foot lined digester. The lower cone and body is lined with Type 316 ELC, and the dome with Hastelloy F. This digester has operated since April 1954. There has been considerable maintenance in the past 15 months that included some structural changes to the screens which should not recur again. Cracks exist in all body and lower cone seams that have been critically examined; however, they do not appear to extend through to the mild steel backing. Some pitting is evident under the scale, but since shower pipes have been installed, the condition is not serious. With the exception of an area behind the screen, where a heavy build-up of scale occurred and required extensive maintenance, the body of the digester has given good service. The Hastelloy F dome has required more repairs. The faults appear largely due to difficulties in satisfactory welding the Hastelloy F rather than to corrosive attack on the material, though there is a fairly extensive area where intergranular type of corrosion has occurred. Several types of welding rods have been recommended by the original designers, but none have proven completely satisfactory to date. The last two inspections have indicated little change in the condition of the lining. The digester is now being washed down with fresh water after each cook, and this retards the formation of scale and hence inhibits corrosion. We are of the opinion that this type of lining will always require more frequent maintenance than a properly designed clad vessel. However, when all the factors are considered, the No. 6 digester has proven superior to the five brick-lined vessels operating under identical conditions.

Stainless Clad Vessels

European Installations:

This type of lining has come into very rapid favor in Europe within the last five years. The Carl Canzler Co. of Düren, West Germany, have fabricated and installed, or have orders for, more than 30 sulphite digesters. The tabulation in Table II was complete as of December 1955, and several more orders are now in their plant.

Table II covers only the Canzler vessels. Uddeholms, Sweden, fabricated one vessel for their mill at Skoghall, and Avesta have made at least two.

We contacted nine of the eleven mills in Europe in which this type of clad digester is operating. The most outstanding feature was that, without exception, the managers, superintendents and engineers responsible for production gave positive unqualified approval of these clad digesters.

In no instance had any repair work been necessary. Four mills were required to polish one or more individual plates which had not been adequately finished when fabricated.

All mills contacted felt that gains in pulp cleanliness were tangible and definite, and all reported production increases for given shell sizes ranging from eight per cent to 30 per cent.

These European digesters were all made of a titanium-stabilized stainless steel.

Two mills were operating with some salt-water-borne wood, but as linings are washed down between cooks and scale kept from building up, no apparent corrosion has been evident.

North American Mill Experience:

We know of clad lined digesters at Dexter, N. Y., and St. John, N. B. The Dexter mill, before closing down, had excellent experience with Type 316 in horizontal digesters. The same management installed three vertical digesters of Lukens-clad Type 318 in their St. John, N. B. mill. Soon after start-up scaling and pitting corrosion was extremely severe in all three digesters except on the polished 316 plates in the third vessel, which were not attacked. This

TABLE II—STAINLESS CLAD DIGESTER INSTALLATIONS BY THE CARL CANZLER CO. OF GERMANY

Buyer	Address	Apparatus	Contents Cu. Feet	Pressure P.S.I.	Inside Diameter	Total Height
Lurgi-Chemie (For Rumania)	Frankfurt, Germany	1 Digester	8000	117	18 ft. 5 in.	46 ft.
Holzzellstoff-U. Papierfabrik	Neustadt, Germany	2 Digesters	5450	147	16 ft. 5 in.	34 ft. 4 in.
Papierfabrik Baienfurt	Baienfurt, Germany	2 Digesters	7000	117	18 ft. 5 in.	40 ft.
G. A. Serlachius Oy	Mantta, Finland	3 Digesters	8250	95.5	18 ft. 8 in.	45 ft. 5 in.
Cellulosefabrik Attisholz	Switzerland	1 Digester	10000	117	19 ft.	46 ft.
Comp. Melhoramentos De Sao Paulo	Brazil	1 Digester	2684	88	13 ft. 1½ in.	29 ft. 11 in.
A/S Toten Cellulosefabrik	Nygaard, Norway	1 Digester	7800	117	18 ft. 5 in.	43 ft. 7 in.
Rauma-Repola Oy	Rauma, Finland	2 Digesters	7800	147	18 ft. 5 in.	45 ft.
Irving Pulp & Paper	Lancaster, N. B., Canada	2 Digesters	7600	103	14 ft. 11 in.	56 ft.
Schwabische Zellstoff	Ehingen, Germany	1 Digester	5340	147	17 ft. 2 in.	33 ft. 6 in.
Lurgi-Chemie (For Japan)	Frankfurt, Germany	1 Digester	7700	117	18 ft. 5 in.	41 ft. 8 in.
The Kellner Partington	Hallein, Austria	4 Digesters	7950	132	17 ft. 9 in.	49 ft. 2 in.
Mjondalen Cellulose A/S	Drammen, Norway	4 Digesters	8500	147	18 ft. 5 in.	47 ft. 6 in.
AB J.S. Enqist Oy	Tampere, Finland	1 Digester	8750	147	19 ft.	43 ft. 7 in.
Jugotehna	Beograd, Yugo-Slavia	5 Digesters	8750	147	18 ft. 5 in.	47 ft. 6 in.

was the first realization of the protection afforded against corrosion by a polished surface.

This mill has switched several times between calcium- and ammonium-base acid. The polished Type 316 plates and a later Canzler digester of polished Remanit 1880 S. S. T. (titanium-stabilized stainless steel) show no signs of corrosion, even though their wood is kept in salt water for varying lengths of time and some chlorides are present.

There is a slight darkening in the dome of the Canzler vessel but the management is not concerned by the condition, and the mill has a second Canzler vessel being installed.

Strainer maintenance, a major item in repair costs with ceramic digesters, is almost nil in stainless clad vessels.

Some of the factors that will now be discussed apply in a degree to stainless-lined digesters as well as the clad vessels, but will only be discussed in connection with clad type.

Admission of Dirt to Stock Systems

The elimination of foreign material from a finished product has always been of major importance. The surest way of keeping dirt out of a finished pulp is to avoid putting it in. Ceramic brick erodes away in service and is the source of much dirt. A rough calculation of the quantities of grit involved: A 19 foot x 60 foot face to face shell with a 7½ inch two-course brick lining has an inside surface area of approximately 3360 square feet. Assume a loss of two inches of lining brick in six years of 335 operating days per year. Then the volume of brick lost to the pulp is:

$$3360 \times \frac{2}{12} = 560 \text{ cubic feet.}$$

Number of operating days $= 6 \times 335 = 2010$. And the volume of grit per 24 hour operating day

$$= \frac{560}{2010} = 0.28 \text{ cubic feet.}$$

In the case of the Columbia Cellulose mill with five brick-lined digesters, there is 5 x 0.28 or 1.40 cubic feet of grit per day, roughly 175 pounds. Imagine the reaction of the Control Department if told that each morning about half a bag of brick grit will be dumped into the blow pit. With stainless clad vessels this source of dirt is avoided.

Another factor that is probably of minor importance, but worth consideration, is that there is approximately 4200 linear feet of horizontal joints where, as the grout erodes away dirt can collect. This dirt will eventually slough off in small batches and contribute to these inexplainable variations in sheet dirt count that all mills experience.

Increased Pulp Producing Capacity per Unit Volume of Digester Capacity

A 7½ inch lining in a 19-foot vessel with a 56 degree bottom cone and a 95 degree upper cone has the volume reduced approximately 18 per cent, and represents the capacity to produce 3300 tons dissolving pulp per digester year.

Effect of the Smoothness Factor on Digester Yield

At Prince Rupert there are six digesters, five brick lined and one stainless lined, operating under identical conditions. A weightometer operates on the chip conveyor to the digesters. Readings recorded over a considerable period of time indicate an average increase of nine per cent more wood to the stainless lined vessel. This mill requires approximately 30 minutes to fill the digesters with chips. If a longer filling time is acceptable the nine per cent will decrease; however, this factor is of major importance again. The nine per cent increase in chip capacity represents approximately 1650 tons per year more pulp from the clad digester than from one of the brick lined vessels.

Less Susceptibility to Thermal Shock

(a) The digester can be rapidly cooled when necessary to inspect or repair. By using cold water showers, it's quite possible for workmen to enter the digester in less than one hour after blowing. Our experience indicates about three hours out-of-service time can be saved each inspection when compared with the brick lined vessels.

(b) Ability to minimize scale by washing the inside of the digester with water immediately after blowing. The effectiveness of this procedure has been proven beyond a doubt in both America and Europe.

(c) The digester needs no careful initial break-in period as is necessary with brick linings.

PROCESS CHANGES

Stainless-clad lining permits the use of any change in process, such as soluble base or two-phase cooking, which is known to the industry.

The major cause of failure in stainless clad or lined digesters will almost certainly be some form of corrosion. Corrosion is a destruction of the metal by electrochemical reaction, and is evidenced by several different types of attack dependent upon many factors, such as the nature of the stresses, type of alloy being used for lining, whether or not scale exists, high velocity of flow near nozzles, and of course, the media in contact with the lining, etc., etc.

A short discussion of the various forms of attack, the severity, and how evidenced will perhaps help to acquaint some with the complexity of the problem.

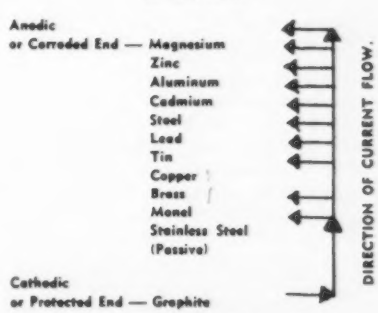
The order of discussion does not necessarily represent the incidence or degree of importance of the type of corrosion being discussed.

1—Intergranular Corrosion

This form is quite common since the factors favorable to such attack result from the elevated temperatures reached during the welding and fabricating of the clad plates.

When austenitic stainless steel is raised to temperatures of 800 degrees to 1600 degrees F., chromium and carbon unite to form a complex carbide in the grain boundaries of the metal. This carbide inhibits the formation of a passive protection film on the surface of the steel. The areas adjacent to where the carbides have formed are to some degree depleted of chromium and one of the conditions (non-homogeneity) is met, setting up a galvanic cell and corrosion. The small particles of metal isolated by the carbides loosen and erode away, leaving a sandy feeling to the surface, and exposing in the process a new surface susceptible to further corrosion, and eventual failure of the section.

In the following galvanic table it is possible to show the potential in volts associated with each element or alloy so that when any two dissimilar materials or even non-homogeneous parts in the series are joined together a galvanic cell is formed, an electric current flows and results in corrosion. The metal forming the anode of the cell will always be the section attacked, and the cathodic end will be protected.



2—Pitting Attack—Oxygen Concentration Cells

This form of attack is of considerable importance where insoluble-base acids are used and scaling is prevalent. Stainless steels exhibit resistance to corrosion when enough oxygen is present to maintain the protective oxide coating on the surfaces. When scale patches form,

oxygen is sealed off from the scaled area, the film breaks down. and corrosion results. Similar types of cells can form in spaces around flanged joints, bolted or rivetted sections, or any place that by the nature of the structural design crevices are formed and not enough oxygen is present to maintain a protective film.

A related type of attack is evidenced where salt solutions are present. If for any reason the concentration of a salt solution is variable, corrosion will result due to a difference of potential causing current flow. The corrosion will generally be evidenced in the area of the higher salt concentration.

3—Attack Resulting From Erosion and Corrosion

At points where the velocity of flow or turbulence of a liquid is high enough to remove the protective film from the metal, corrosion will result. Because no film exists to prevent attack, and new films are broken up and swept away as quickly as they are formed, pitting or grooving of the metal results. In digesters it may be apparent near the pump suction nozzles behind the strainer.

4—Stress Corrosion

The one factor invariably associated with stress corrosion is that of high tensile stresses, generally of magnitudes at or near yield point. Normally, the stresses are of a residual nature rather than impressed by external application. The internal stresses can result from mechanical deformation, or because of warping from the welding operations, but in a concave internal clad vessel where the coefficient of linear expansion of the cladding exceeds that of the backing material and which has been stress-relieved at around 1100 degrees F., the cladding will generally be left in tension and subject to corrosion.

Stress cracking frequently occurs with little surface attack apparent; although in other instances there will be a localized attack sufficient to initiate the crack associated with failure. In austenitic-type stainless steels that we are discussing the cracks are transgranular as opposed to the intergranular failure brought about by carbide precipitation. Furthermore, when a fractured surface can be observed, numerous fine cracks will be present that appear to wander aimlessly about in contrast to one major cleavage common to a failure from fatigue, or the granular appearance caused by carbide precipitation.

The foregoing description of the several types of corrosion that may be encountered in stainless-clad sulphite digesters is very elementary. I hope it will suffice to acquaint the readers or listeners, as the case may be, with a concept of the problem.

Choice of a Digester Lining Material

A study of available data pertaining to the use of stainless clad or lined sulphite digesters brings to light many apparent contradictions and inconsistencies. To indicate a few examples.

Europe: Excellent record of trouble-free production with 30 or more vessels over a period exceeding five years.

America: Every vessel installed has had a history of maintenance and repairs that has discouraged wider acceptance by the industry.

Europe: In no case has it been found necessary to use a more corrosion-resistant alloy in the dome section.

America: All except two mills have experienced an accelerated attack in the upper dome section and found it necessary to use a more costly material to line this area than was used in the remainder of the vessel.

Europe: None of the vessels have been stress relieved.

America: Code requirement calls for stress relieving, with the associated danger of initiating carbide precipitation.

Europe: Titanium stablized types of stainless steel have been used exclusively in clad sulphite digesters.

America: Our metallurgists have favored the use of E.L.C. grades. The material to date generally appears to be in short supply.

Being thoroughly confused with the records of the inconsistent performance between European and North American mills, but still having in mind the evident advantages inherent to users of clad digesters, we attempted to find logical answers as to why such differences exist.

The following paragraphs summarize my conclusions, and at the same time attempt to explain the factors which have contributed to these conclusions.

One must acknowledge the success to date of European installations as opposed to the experiences in Canada and the United States. Inquiries into mill practices indicated that:

1—Cooking cycles were about two to three times as long as those we employ.

2—Maximum pressures and temperatures are not too different.

3—Wood compares more nearly to that used in Eastern Canada.

4—Acid strength is approximately the same.

5—A majority of the mills use pyrites for making SO_2, sometimes in combination with sulphur burner gas. One mill purchased liquid SO_2 in tank cars.

6—A majority of the mills used calcium-base acid.

7—The majority of the mills use electrostatic precipitators on the gas from the pyrites burners to remove SO_2.

8—Scaling is not a major problem. Two mills that we contacted did not have precipitators and reported serious scale build-up.

9—All mills wash the digesters down in some way between cooks.

10—All stainless-clad linings used have been polished equivalent to about 100 grit finish.

11—At least 30 of the vessels to date are supported on a skirt, and not by welding on four or six legs, as the case may be, and thus contributing to high localized stresses.

12—All vessels have been fabricated from titanium-stabilized stainless steel rather than E.L.C. grades.

13—We could find no agreement between mills as to screen location or division of liquor between top and bottom, so have concluded it is of minor importance.

14—All digesters are insulated.

15—The majority of mills use indirect heaters and some form of forced circulation.

An evaluation of all apparent factors leads me to certain conclusions.

Most Resistant Type of Material

In America, metallurgists have developed E.L.C. grades in an attempt to produce stainless steels that do not undergo carbide separation when subjected to elevated temperatures. I understand the development of these low carbon steels was guided by the Hueye nitric acid test, which indicates the effect upon steel when subjected to a *powerful* oxidizing agent. Sulphite digesters normally operate under reducing conditions, acid at a temperature of approximately 300 degrees F. containing SO_2, and as a result the E.L.C. grades may not be superior for this use.

Under reducing conditions there is evidence to show that steel stabilized with either titanium, columbium, or tantalum is superior, and that of the three, titanium has factors in its favor:

(a) Cost is generally less.

(b) Titanium is an element in itself inhibits corrosion.

There is ample evidence to show that a digester clad with the type of stainless steel having the following approximate analysis:

Cr.	17.5 — 19.5%
Ni.	12.5% ±
Mo.	2.5% — 3.5%
Si.	0.4%
Mn.	1.2%
C.	0.08% (not over 0.03% if titanium absent)
Ti.	5 times C., or 0.03% and no titanium.

will give satisfactory service even though some chlorides are present from sea water-borne wood.

Polishing

Experience indicates that polished surfaces do not readily scale, and thus avoid the pitting type of corrosion commonly associated with scale. Evidence supporting this contention was observed in three mills; at Irving Pulp and Paper Ltd. where one or more polished 316 plates in their digester had resisted all corrosion; at Nygaard in Norway where three plates had not been polished and were completely scaled over but the remainder of the inner surface was clean and free of scale; and at Ehingen in Germany where a similar condition existed and one unpolished plate and part of two others were heavily scaled while all the remainder of the surface was clean and bright. It is my opinion that finishing with two operations of 60 and 80 grit and then followed with wet slurry polishing will give the necessary degree of smoothness to inhibit scale. Based on observations, this factor is extremely important, and should be included as a specification.

Welding

I feel the welding factor is of great importance, and although much has been learned from work done in connection with nuclear plants, the combination of electrodes used to give the desirable analysis of the weldment must be carefully specified and accurately controlled. We have had several discussions on this with Dominion Bridge, and much experimental work has been done. However, we are not yet satisfied, although the results to date are encouraging.

Our decision now is to use the following welding procedure on our new digester:

1—Preparation of edges shall be done by machining, burning, chipping or grinding.

2—The joint profile when ready for welding shall be substantially as shown in Figure 1.

3—If the root gap exceeds the tolerance in Figure 1, 5/16 inches mild steel electrode wires shall be added to the joint to act as backing metal for the first layer of weld metal from the carbon steel side. The backing wires shall be tacked only on the carbon steel side.

4—Welding shall start from the carbon steel side. The electrodes to be used shall be E-7016, low hydrogen, or low hydrogen iron powder type equivalent to Stelco 716 I. P. The joint shall be fully or at least 50 per cent welded on the carbon steel side before back-grooving.

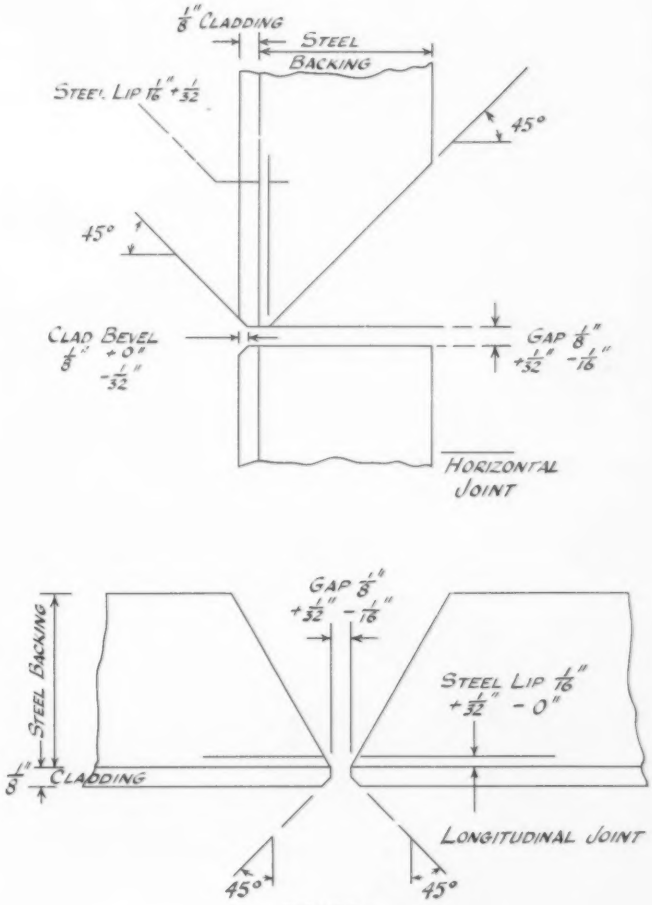


FIGURE 1

5—Back-grooving on the clad side shall be done using pneumatic chipping hammers with U nose tools. The depth of chipping shall normally be between ¼ inch to 5/16 inch in depth, but must be carried into solid metal of the backing side.

6—Spot X-ray of the carbon steel weld metal shall be done before welding the clad side to the following extent:
(a) 25 per cent of the length of each seam during the first week.
(b) 15 per cent of the length of each seam during the second week.
(c) 10 per cent of the length of each seam during subsequent weeks.

X-ray technique and interpretation of films shall be in accordance with the requirements of Section VIII of the A. S. M. E. Code.

7—Welding on the clad side of the vessel shall be done as follows:
(a) First weld layer—A. O. Smith SW 368.
(b) Second and third layer—Airco 317-L, AC-DC.

Note: If the back-grooving (Paragraph 5) exceeds 5/16 inch in depth, an additional layer of A. O. Smith SW 368 electrode weld metal shall be made. The width of final layer shall be kept to a minimum not to appreciably exceed ¾ inch.

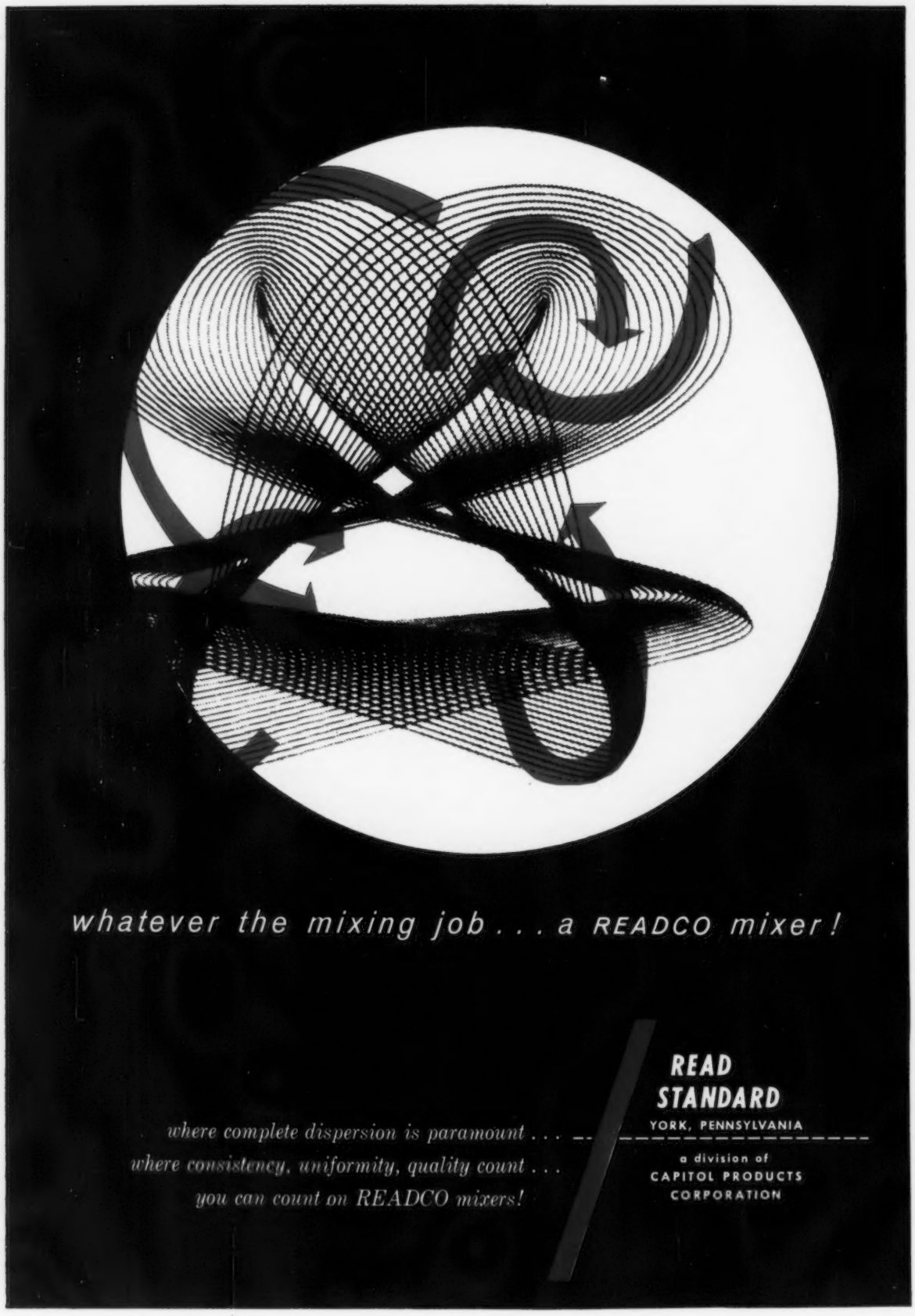
8—The final layers on the clad side shall be buffed with tampico brushes and slurry to produce a luster finish over the rippled and undulated surface of the weld. Where undue roughness exists, the weld surface may be lightly ground prior to buffing.

Stress Relieving

Raising the temperature of stainless steel over 800 degree F. is recognized as detrimental and lowers the resistance to corrosion.

Two insurance companies with large

(Continued on page 48)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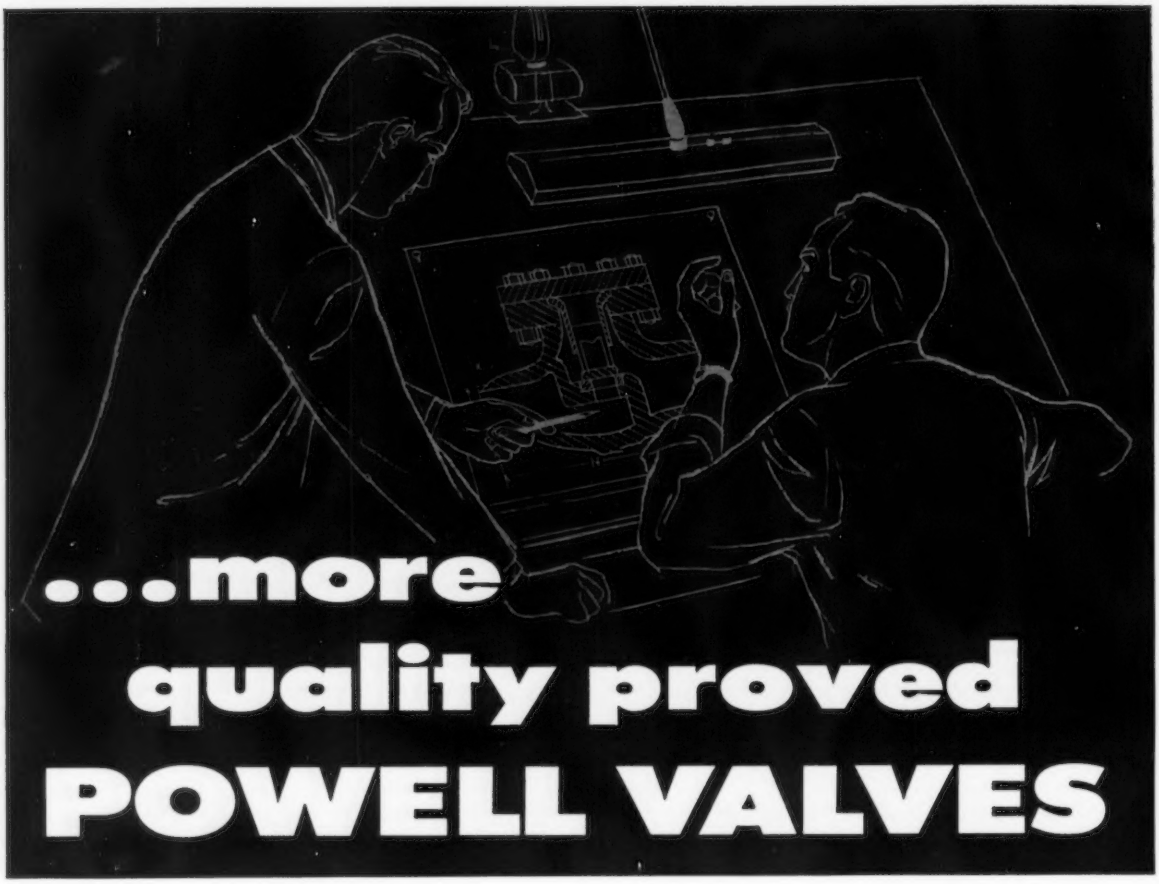

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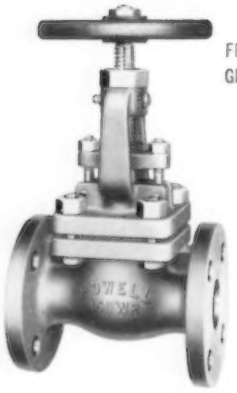

FIG. 2475—Stainless Steel O.S. & Y. Globe Valve for 150 Pounds W.P.

FIG. 2309 SW—150-Pound Flush Bottom Tank Valve with Powell Patented Seat Wiper.

FIG. 2456 SG—Large Stainless Steel Gate Valve for 150 Pounds W. P. Flanges conform to latest Standards.

FIG. 2433 SS—Large Stainless Steel Swing Check Valve for 150 Pounds W.P.

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Controlling Corrosion

An automatic pulping system, exceedingly flexible and adaptable, utilizes clad steel "rapid cycle" digesters.

By Joseph H. Proctor, *Manager, Marketing Service,* Lukens Steel Company

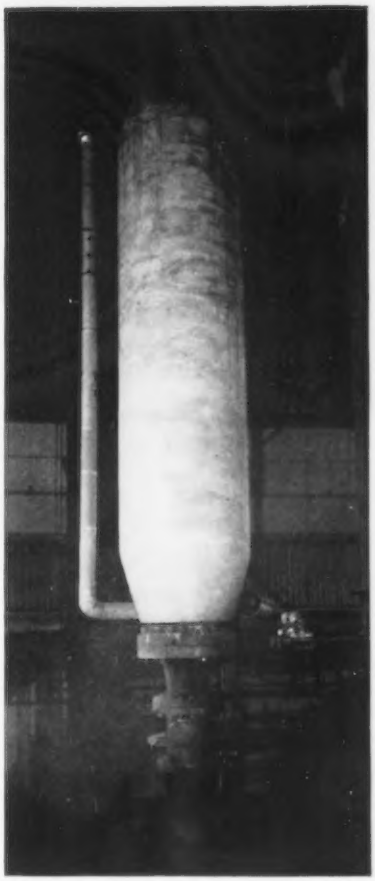
Elimination of a bottleneck in the production of wood pulps is, in many instances, overcome by increasing capital expenditures in order to increase the number and/or size of digesters. This costly and not always practical manner of breaking the bottleneck, on occasion, has been avoided by the installation of the "rapid cycle" digester system as designed and built by The Bauer Bros. Company of Springfield, Ohio.

Relatively short cycles and small batches are involved in the system as a result of process automation and the utilization of high pressures up to 300 psi.

To combat the corrosive agents normally experienced in the cooking of pulp, particularly at such high pressures, clad steel was chosen as the digester material. Specifically, it is Lukens 20% Type 316 stainless-clad steel providing a corrosion-resistant layer of stainless steel on the vessel interiors. This clad steel provides an integral bond between the stainless and carbon or low alloy steel backing, which gives additional protection from thermal shock caused by cyclic operation and thus minimizes maintenance difficulties.

Automatic and Flexible Process

Another feature of the "rapid cycle" process is the large, high pressure sliding gate and plug-type valves for charging and discharging the digesters. The diameters of the digesters are kept small (approximately 36" to 54") to maintain uniformity of cooking and to avoid channeling which normally occurs in larger vessels of a similar nature. The length of the digester varies according to required capacity, which is usually from 80 to 300 cu. ft. Since all operations are performed in this relatively small vessel, many variations of procedure are possible that are not practical in the conventional or stationary digester. Also, the size permits the economical utilization of any of the well-known methods of chip impregnation with cooking liquor which, in turn, permits the rapid rise in cooking temperature necessary for short cooking cycles.



Lukens stainless-clad steel combats corrosion and high pressure in this Bauer "rapid cycle" digester.

All operations for the entire pulp cooking cycle are set up for automatic control from one central control panel, which substantially reduces operating costs. This automation can include control of pulping from the chip bin or conveyor to the refined stock chest; and once the required pulping cycle is established, it will repeat continuously until stopped by the operator or by one of the system controls.

Dependability of Equipment

The development of an automatic pulping system of this nature took extensive engineering and laboratory experimentation. All components had to be dependable, and maintenance down time kept to a minimum; therefore, the system was designed to be as simple as possible, with reliable materials chosen for construction.

It is another example of effective control of corrosion with clad steel in pulp and paper industry equipment. Besides extending the service life of digesters, clad steel has raised operating efficiency and lowered maintenance costs in head boxes, beater tubs, and blow pits. In each such application, the combination of cladding and backing can be tailored to meet specific needs.

Clad Steel Data on Request

Information about the many uses of clad steel, its workability, varieties, characteristics, and application to any specific problem can be obtained from the Manager, Marketing Service, 953 Lukens Building, Lukens Steel Company, Coatesville, Pa. This company is the oldest and largest producer of clad and alloy steel plate in the world and will gladly provide you the benefit of its experience in producing steels for the paper industry. Write for the 28-page bulletin, "Clad Steel Equipment."

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What Factors Influence Grinder Capacity

Dr. K. H. Klemm

Manager, München Dachauer Papier Fabriken
Munich, Germany

To keep pace with the great increase of paper production following the Second World War, the main development emphasis in grinder construction was aimed at raising their capacity. Along with the increase of capacity, however, the groundwood quality requirements were also increased because much of the additional paper production resulted from a marked increase in machine speeds. This made the requirements demanded from the new grinder designs particularly difficult and not all developments were able to achieve both higher production and better quality at the same time. Therefore, before describing modern grinder types, some considerations related to the capacity of grinders are presented.

Considerations in Grinder Capacity

For simplification, the following considerations are restricted to the conditions which prevail at continuous chain grinders. From the concepts shown previously, it is known that defibering of wood is related to the terms "Initial Grinding Time", "Rate of Feed During Initial Grinding Time" and "Initial Grinding Factor". If

- T_g = Initial Grinding Time in milliseconds
- W = Length of grinding zone in feet
- S = Surface speed of the stone in feet per second
- d = Stone diameter in feet
- r = Shaft r.p.m.
- S_w = Rate of feed of wood during the Initial Grinding Time in microns
- C_a = Average production in tons (o.d.)/24 hours

Preparation of English text by G. P. Chinn, Control Supt., Anglo-Newfoundland Development Co., Grand Falls, Nfld.

- y = Average groundwood yield in pounds per cord
- l = Wood length in feet
- f = Average diameter of the fibers in microns
- F_i = Initial Grinding Factor
- C_{th} = Theoretical maximum production of high quality groundwood in pounds (o.d.) per day

then, as the Initial Grinding Time is dependent upon the length of the grinding zone and the surface speed of the stone

$$T_g = \frac{1000\,W}{S} = \frac{60{,}000\,W}{d\pi r} \text{ (milliseconds)} \quad \ldots (1)$$

The feed of the wood during the Initial Grinding Time can be calculated from the average production if the average yield of the wood available is known:

$$S_w = \frac{(451.1)\,C_a}{y\,l\,S} \text{ microns during } T_g \quad \ldots (2)$$

Finally, if the average diameter of the fibers prevailing in the wood is known, the Initial Grinding Factor can be calculated from the formula

$$F_i = \frac{f}{S_w} = \frac{y\,l\,S\,f}{(451.1)\,C_a} \quad \ldots (3)$$

As already mentioned, at an Initial Grinding Factor, $F_i = 1$, the maximum number of undamaged single fibers can be expected* and from this, the theoretical maximum production for high quality groundwood can be calculated

$$C_{th} = \frac{y\,l\,S\,f}{451.1} \text{ pounds (o.d.)/24 hours} \quad \ldots (4)$$

From this formula, it must be concluded that, for a given wood (y and f constant), the capacity of a grinder can only be increased without decrease of groundwood quality by increasing the wood length and/or the surface speed of the pulpstone.

With regard to the stone surface speed, however, there is a limitation because, naturally, this cannot be increased indefinitely. By the evaluation of the conditions which prevail in practice it must be concluded that an optimum Initial Grinding Time exists at about 50-60 milliseconds because this range is successfully used with most grinder types. In addition, it is known that increasing the stone surface speed of the normal chain grinder (3.3-foot length of grinding zone) had detrimental effects on stock quality† while with the Roberts grinder, where the length of the grinding zone is five feet, very high

*A high percentage of undestroyed, single fibers is especially required for newsprint type groundwood. For the production of slow groundwood, an Initial Grinding Factor below 1.0 is necessary. These considerations, therefore, are restricted to production of groundwood for newsprint. However, by introducing values for $F_i = 0.7$ or 0.8, they can also apply to slower groundwood types.

†Grinders of this type which were designed for 300 r.p.m. ($T_g = 42.5$ milliseconds) were geared down at considerable cost to 245 r.p.m. ($T_g = 52$ milliseconds).

surface speeds (84 feet per second) are used. In this latter case, however, the Initial Grinding Time is still in the order of 60 milliseconds. While further investigations on this subject are necessary, the introduction of the term "Initial Grinding Time" to replace the surface speed of the stone can be used to explain the observations made by Jones and Holland (1) relating to the influence of surface speed with different grinder types. These authors mentioned that there must be a time factor involved but did not follow this point more closely. The apparent necessity of an Initial Grinding Time of 50-60 milliseconds can be explained by lignin plasticization requiring a certain minimum reaction time.

Accepting the concept of the initial grinding time from the formula

$$T_g = \frac{1000\,W}{S}$$

it can be shown that further increasing the stone surface speed is without detrimental effects on groundwood quality only if, at the same time, the length of the grinding zone is also increased. Therefore, increasing the capacity of a grinder by raising the surface speed required, must at the same time, be accompanied by increased stone diameter in order to give a greater length of grinding zone and so maintain the Initial Grinding Time in the correct range. Collicut and Cochrane (2) and Clarke (3) have found, during their measurements, that the production of a grinder increases with the stone surface speed without influencing the quality of the groundwood. However, the results of other authors were quite the contrary (e.g. those of Holland (6), Brecht (4) and Schafer and Pew (5). Schafer and Pew already have emphasized a relationship between length of grinding zone and the traveling rate of wood but a complete explanation of the contradictory results and experiences with practical operation was only possible with the introduction of the term "Traveling Rate of Wood during the Initial Grinding Time". This becomes especially evident if one considers that the results of Collicut and Cochrane are related to Roberts grinders with their very great length of grinding zone. With these grinders the surface speed can be increased considerably before the lower limit of the Initial Grinding Time (50 milliseconds) is reached. Applying these conditions to chain grinders, an increase of capacity without decrease of quality can be expected with the conditions shown in Table I.

If:

L = Grinder Load in hp.

P_t = Specific energy consumption in hp. day/ton, by using formula (4) and introducing

$$S = \frac{1000\,W}{T} \text{ from formula (1)}$$

$$C_{th} = \frac{2.217\,y\,f\,l\,S}{T_g} \text{ pounds o.d./day} \quad \textbf{(5)}$$

and substituting the well-known production formula

$$C_a = \frac{L}{P_t}$$

in formula **(5)**

$$P_t = \frac{0.451\,L\,Tg}{y\,f\,l\,W} \text{ hp. day/ton (o.d.)} \quad \textbf{(6)}$$

This indicates that the specific energy consumption, all other conditions being constant, increases with the Initial Grinding Time; a fact which is supported by practical experience. The chain grinder data shown in Table I may prove this point. The concept of an economic and quality optimum at an Initial Grinding Time of 50-60 milliseconds, therefore, appears to be supported from different angles and leads to the conclusion that the selection of the shaft speed of the pulp stones should not be made with regard to the stone surface speed but with regard to the Initial Grinding Time (formula **5** above).

Use of Longer Wood

Considering the difficulties which are related to increasing capacity by increasing the stone surface speed, it is hard to understand why the second possibility, to increase the capacity by the use of longer wood, was not applied until recently. There are no difficulties connected with the grinding of longer wood blocks except those related to the construction of large enough pulpstones and strong enough grinder shafts. The theory that, during groundwood production, the wood blocks act like doctor blades and carry the pulp to the sides of the pulpstone cannot be accepted. The groundwood is carried in the surface cavities between the stone and wood to the grinder pit and the wood length does not influence this action. In recent years, the trend in North America has been to use longer wood and recent installations of Great Northern grinders provide for 5 foot blocks. This method of increasing the capacity can be applied with all grinder types. As an example, the effect of increasing the wood length with chain grinders is shown in Table II.

The foregoing considerations were

TABLE I—CONDITIONS NECESSARY TO PERMIT INCREASED CAPACITY FROM CHAIN GRINDERS WITHOUT LOSS IN GROUNDWOOD QUALITY

Stone Diameter—inches	59	71	79
Shaft speed—r.p.m.	245	265	275
Length of grinding zone—inches	39	51	59
Stone surface speed—ft./sec.	63	82	94
Initial Grinding Time—milliseconds	52	52	52
Production—tons o.d./day	20.4	26.5	30.4

TABLE II—CHAIN GRINDER OPERATING DATA

Stone diameter—inches	59	71	71
Shaft speed—r.p.m.	245	245	216
Length of Grinding zone—inches	39	51	51
Surface speed of stone—ft./sec.	63	75	67
Initial Grinding Time—millisec.	52	56.5	64
Production—tons o.d./day	20.4	37.2	38.1
Groundwood Freeness—Can. Std.	100	115	105
Specific energy consumption —hp. day/ton	58.3	65.0	69.1

TABLE III—RELATIONSHIP BETWEEN CAPACITY AND WOOD LENGTH FOR CHAIN GRINDERS

Wood length—inches	39	59	79
Shaft speed—r.p.m.	245	245	245
Production—tons o.d./day	20.4	30.4	40.7

simplified insofar as they relate to continuous chain grinders producing newsprint quality groundwood. They can, however, be applied to all grinder types and groundwood qualities when the necessary modifications are made. The examples given may emphasize the importance of the correct ratio between the different construction variables, especially when it is realized that an increase in the specific energy consumption of 10 per cent may result in higher costs in the order of $60.00 per ton of daily capacity per year.

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NEWS OF CONVERTERS

Arthur J. Roemer

Promotions at Appleton Coated

Arthur J. Roemer, Appleton, Wis., has been promoted to plant engineer at Appleton Coated Paper Co.

Hans Hefti, plant engineer since 1937, will stay on beyond his retirement date as research engineer with duties confined exclusively to special projects in the research and development field.

Mr. Roemer has been with the firm since 1945 and previously was in the engineering department at Marathon Corp. and Alliscon Division of General Motors Corp.

Robert F. Lichtfuss has been appointed assistant plant engineer.

Bird & Son Seeks Union Election

Bird & Son, Inc. has petitioned the National Labor Relations Board for a union election in its roofing material plant at Charleston, S. C.

The roofing manufacturing company has said it feels the plant's union, Local 663, International Brotherhood of Papermakers, no longer represents the majority of plant workmen. It has asked the NLRB to investigate and hold a plant election to determine if a majority of the employees want the union.

A nine-week strike at the plant ended last week with employees returning to work at the same wage offered by the company before the walkout last July. The company estimates workers lost $58,000 in wages, or $635 per worker, in refusing the company's July offer and deciding to strike.

Fibre Box Assn. Files Complaint with ICC

The board of directors of the Fibre Box Assn. has voted unanimously to file a formal complaint with the Interstate Commerce Commission against H. R. Hinsch's Tariff 691-A which provides for the shipment of laundry machines and dryers in racks, with charges based on the net weight of the merchandise.

This tariff, which became effective on June 5, 1957, was opposed before its issuance by the association and its members on the grounds that it discriminated against shippers of laundry and drying machines who were unable to use racks. The association will ask the Commission to declare the tariff unlawful on the grounds that by assessing freight charges only on the weight of the appliances and not the racks, the tariff is unduly discriminatory and violates the Interstate Commerce Act. Shipments of laundry and drying machines in conventional corrugated containers are assessed charges not only on the weight of the appliance but also the weight of the container.

Adams, Kuhn Named To Racquette River Posts

Orchard Paper Co. has appointed Donald Adams general production manager of the Racquette River Paper Corp. converting plant, Potsdam, N. Y.

Mr. Adams, formerly material handling and finishing supervisor for pulp, paper and converting, assumed his new production duties upon the recent sale of Racquette River pulp and paper making facilities to Nekoosa-Edwards Paper Co. He is now responsible for directing the production of Racquette River's converted industrial and packaging products.

With Orchard five years, Mr. Adams was transferred from the St. Louis mill in early 1955, upon purchase of the Potsdam facilities from the former Racquette River Paper Company.

Dr. Donald Kuhn, personnel director for Orchard Paper Co.'s Racquette River Division, has been appointed sales service liaison manager for the plant at Potsdam, N. Y. An industrial psychologist, he will be responsible for liaison between Orchard's St. Louis and Los Angeles plants, and the Racquette River converting operation. All Racquette River order processing, corres-

pondence, etc., will continue to be handled from the St. Louis office by the sales service staff under direction of Roemer Wilbas. He will continue to function as personnel director, in charge of Racquette River's industrial and human relations programs, and personnel development and training.

Major Addition to Mac-Sim-Bar Plant

Mac-Sim-Bar Paper Co. has started work on a 23,250 sq. ft. addition to its plant in Otsego, Mich. It is expected to cost between $160,000 and $175,000.

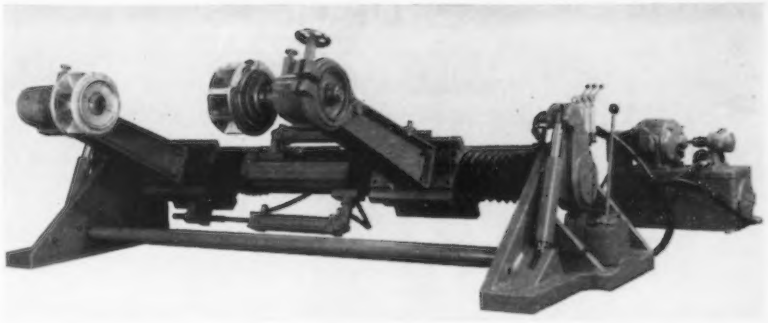
The addition is scheduled for completion by January 1, 1958. It will measure 150 by 155 feet square, with half of it to be of two-story construction through the use of a "half-basement." Located next to the present finishing room, the building will be devoted entirely to the finishing and shipping departments.

Rejuvenates Composition and Rubber Materials

Anchor Chemical Co., Inc., 827-837 Bergen St., Brooklyn, N. Y. has recently announced a composition and rubber rejuvenator called "Velvee." This rejuvenator was developed to eliminate dirt, ink, gum and lint trapped in the pores of rollers and blankets by gum-glaze. This condition causes poor ink distribution, slurring, embossing, heavy halftone dots, and prevents sharp clear impressions and bright clear colors as well as causing plate blindness and roller stripping on offset presses. Printers and lithographers have had either to contend with the effects of this condition or have spent many hours and much effort to remove it.

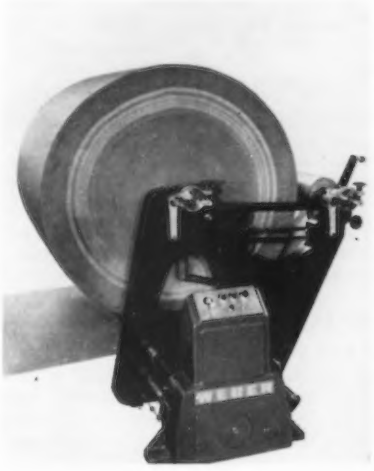
It is claimed that "Velvee" overcomes these impediments to good printing by breaking through the gum-glaze barrier and releasing all ink, gums, offset sprays, lint, water soluble materials, etc. trapped in the pores of rollers and blankets and allows them to be washed away with the printer or lithographer's regular wash-up material. Once the pores of the rubber have been cleansed, rejuvenators in the new product go to work and treat, revive and enhance rollers and blankets.

Composition rollers of the glue glycerine variety have a tendency to dry out and become hard and brittle. "Velvee" restores these rollers to the right tack. It also renews rubber's receptivity to ink. According to the manufacturer, printers and lithographers can produce cleaner, sharper copies and make exact color reproductions because all old pigments and varnish can now be completely removed.



Shaftless Roll Stand

Shown in the picture is one of the models of shaftless roll stands being manufactured by the H. G. Weber & Co., Inc., Kiel, Wis. This model is presently in use in one of the leading paper mills. Models are available in a range of styles from a simple manual type to completely automatic equipment. A few of the specifications are: 72 in. maximum roll diameter, 60 in. maximum web width, 8000 lb. maximum roll weight, hydraulic chucking feature, hydraulic edge alignment feature, hydraulic roll lifting feature and tension brake—manual and automatic.



Flying Splice Unwind Roll Stand

The Weber "RST" flying splice adjustable unwind roll stand is a newly developed unit built to accommodate maximum web widths up to 84 in. and roll diameters up to 60 in.

The adjustable feature makes it possible for the side frame members that support the spindle ends to be set at a very minimum distance from the edge of the roll regardless of the web width. This eliminates the spindle deflection which occurs when narrow rolls are mounted on a roll stand that was designed to accommodate a wide roll.

The Weber "RST" unit was designed to eliminate down time with the flying splice arrangement and to control quality by means of automatic edge alignment control. It is adaptable and ideal for all types of paper converting equipment such as laminating, waxing, coating, printing, etc. All of the features that have been incorporated into the unit have been done so with the emphasis on simplicity of operation.

For further information write H. G. Weber & Co., Kiel, Wis.

Butler Creates Container Div.

Butler Co., Chicago, has created a new division to be known as Butler Container. Dan P. Mumaw is vice president and general manager, with main offices at 673 Fifth Ave., New York City. Mr. Mumaw for the last seven years has been Eastern Division manager for container sales of the Forest Products Division of Olin Mathieson and its predecessor company, Kraftco Container Corp.

Consolidated Has New General Manager

James E. Purcell has been appointed general manager of Consolidated Paper & Box Manufacturing Co. Inc. after two years as sales manager for both the carton manufacturing and wholesale paper operations. William J. Nolet Jr. will succeed him as sales manager.

Trigg Appointed Chase Bag Manager

John B. Trigg has been promoted to manager of the Chase Bag Co.'s Buffalo manufacturing branch. He succeeds Harrison B. Rue, who will direct sales of textile, saxolin and small paper bags in the company's Chicago headquarters.

Mr. Trigg will continue as Buffalo sales manager, a position he has held the past four years.

PRICES OF FIBERS

MARKET WOOD PULP

THIRD QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	§$83.00/ 86.00§	§$92.00/ —	§$77.50/ 90.00
Kraft, Blchd.	152.00/155.00	155.00/ —	$155.00/ —		$155.00/ —
Kraft, Blchd. Hdwd.	150.00/ —		$137.00/ —		
Kraft, Semi-bleached	140.00/ —	135.00/140.00	$135.00/140.00§	*137.50/142.50	
Kraft, Unbl.	117.50/125.00	120.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	150.00/ —	150.00/ —	*150.00/ —	*150.00/ —	145.00/147.50†
Sulphite, Unblchd.	130.00/ —	130.00/ —	†130.50/ —	*130.00/ —	
Sulphite, Unb'l. Gl'sn		129.00/ —	†129.00/ —		
Soda, Blchd.	142.50/145.00	145.00/ —			

§ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances

NEW YORK RAG MARKET

New Domestic Cotton Cuttings
Delivered Mill Basis
PRICES NOMINAL

	Per 100 lbs.
No. 1 White Shirts	$13.50/$14.00
No. 1 Unblchd. Muslins	16.00/ 16.75
Blchd. & Unblchd. Underwears	15.00/ 15.50
No. 1 Light Silesias	7.00/ 7.50
No. 1 Light Blue Overalls	7.25/ 8.00
Percales	6.00/ 6.50
No. 1 Light Prints	5.00/ 5.50
Suntan Khakis	5.50/ 6.25
Cottonades	3.25/ 3.75
No. 1 Washables	2.50/ 2.75

Old Domestic Cotton Rags

(Prices to Dealers, f.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$3.00/$3.25
Cotton Pants & Overalls	2.00/ 2.25
Twos and Blues, Repacked	1.50/ 1.75
No. 2 Roofing	.60/ .70

COTTON LINTERS

Memphis Market
f.o.b. Oilmills

Week Ended September 23		For 100 lbs.
Grade 1	n.a.	
2		$9.50/ $9.25
3	1 cut—felting	8.75/ 7.75
4		8.00/ 7.00
5		7.00/ 6.50
6		6.00/ 5.50
7		5.50/ 5.00

*Based on 73% cellulose.

Old Rope & Bagging

(Prices to Dealers, f.o.b. N.Y.)

	Per 100 lbs.
New Burlap Cuts	$5.75/$6.50
Scrap Burlap	4.50/ 5.25
Australian Wool Pouches	5.25/ 5.75
Gunny	5.50/ 6.25
No. 1 Domestic Manila Rope	7.75/ 8.25
No. 1 Foreign Manila Rope	6.25/ 6.50
Domestic Sisal Strings	4.25/ 4.50

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	September 23	September 23	September 23	September 23
No. 1 Mixed Paper	$4.00/ 6.00	5.00/ 7.00	4.00/ —	12.00/ —
No. 1 News	13.00/ 15.00	11.00/ —	12.00/ —	11.00/ —
Overissue News (Lg. size)	14.00/ 16.00	12.00/ 14.00	17.00/ —	13.00/ —
Mill Wrappers	11.00/ 13.00	9.00/ 14.00	7.00/ —	13.00/ —
Old Corrugated Containers	24.00/ 25.00	21.00/ 25.00	25.00/ 27.00	18.00/ —
Super Resorted Kraft Paper	30.00/ 35.00	35.00/ 42.00	30.00/ —	45.00/ —
New Double Kr. Ld. Corr. Cuts	25.00/ 30.00	37.00/ 40.00	35.50/ —	30.00/ —
(Semi-chem. medium)	45.00/ 50.00	45.00/ 50.00	45.00/ 50.00	40.00/ 45.00
New 100% Kraft Corr. Cuts	50.00/ 55.00	50.00/ 55.00	55.00/ —	40.00/ —
New Br. Kraft, Env. Cuts	65.00/ 70.00	70.00/ 75.00	55.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	50.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	65.00/ 75.00	65.00/ —	45.00/ 50.00
No. 1 Groundwood Shvs.	25.00/ 30.00	20.00/ 30.00	22.00/ —	25.00/ 30.00
White Newsblanks	50.00/ 55.00	45.00/ 55.00	40.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	60.00/ 65.00	60.00/ —	— / —
Super Soft White Shvs.	65.00/ 70.00	70.00/ 75.00	70.00/ —	— / —
Hd. White Shvs.	90.00/ 95.00	100.00/110.00	85.00/ —	85.00/ 90.00
Hd. White Env. Cuts	115.00/125.00	120.00/125.00	95.00/ —	100.00/110.00
Col. Tab. Cards	50.00/ 60.00	55.00/ 62.00	47.50/ —	30.00/ —
Manila Tab. Cards	60.00/ 70.00	70.00/ 75.00	65.00/ —	49.00/ —
No. 1 Col. Ledger	30.00/ 32.00	30.00/ 35.00	40.00/ —	27.50/ —
White Ledger	50.00/ 55.00	50.00/ 55.00	55.00/ —	35.00/ 40.00
Mixed Book & Mag.†	18.00/ 20.00	19.00/ 20.00	12.00/ —	— / —
No. 1 Books‡	25.00/ 27.00	22.00/ 24.00	27.50/ —	— / —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

PRICES OF MATERIALS

Aluminum sulphate:		
coml. bulk, c.l. wks. cwt.	$1.85	/ 2.05
iron-free, c.l. wks. cwt.	3.55	/ —
Casein, acid prec.:		
dom. sh. pt. c.l. (30 mesh) cwt.	56.00	/ —
Arg. ex. dock cwt.	21.75	/22.00
New Zealand cwt.	22.50	/23.50
Caustic soda:		
c.l. wks. solid, 76% cwt.	4.30	/ —
flak. & grd. drums, c.l. cwt.	4.70	/ —
liquid 50% tanks.	2.90	/ 3.00
liquid 73% tanks.	3.00	/ 3.10
China Clay		
dom., dry-grd., airfloat:		
325 mesh bgs., c.l. Geo. ton	10.00	/ —
300 mesh, bgs., c.l. Geo. ton	13.50	/14.50
imp., white, lump, c.l. ex. dock	20.00	/35.00
Chlorine:		
single-unit tanks, works. cwt.	3.15	/ —
multiple unit, 2-5 cars per yr.	5.25	/ 4.05
Lime:		
hydrated, bulk, c.l. N.Y. ton	23.63	/ —
quicklime, bulk, c.l. N.Y. ton	22.13	/ —
Gum rosin:		
K, M, N, drums, c.l. Savan, cwt.	7.45	/ 7.55
Rosin size:		
70%, gum & pale paste, tank cars, south, sh. pt. cwt.	7.44	/ 7.48
Saltcake:		
dom. bulk, 100% anh. wks. ton	28.00	/ —
Soda ash:		
light, 58% ash bags, wks. cwt.	1.90	/ —
bulk, c.l. wks. cwt.	1.60	/ —
Sodium chlorate:		
tank-cars, wks. cwt.	8.15	/ —
drums, wks. cwt.	9.00	/ —
Sodium peroxide:		
dms., c.l. E. of Miss. lb.	.20½	/ —
l.c.l. (same basis)	.21	/ .21½
Sodium silicate, 40° Be.:		
tank-cars, wks. cwt.	1.40	/ —
drums, c.l. wks. cwt.	1.55	/ —
47° Be. WW.		
tank-cars, c.l. wks. cwt.	1.90	/ —
drums, c.l. wks. cwt.	2.25	/ —
Soybean, protein:		
chem. isol., wks. c.l. bags. lb.	.23	/ —
Starches:		
corn, multiwalls, c.l. prod. plant:		
pearl cwt.	6.49	/ 6.75
white, dextrins cwt.	8.08	/ 8.20
chlorinated cwt.	8.25	/ 8.35
potato, Idaho, c.l. wks. cwt.	6.50	/ —
East, fr. all. 50 cents cwt.		
potato, Maine, f.o.b. wks. cwt.	6.25	/ —
Sulphuric acid:		
60° Be. cbys. c.l. wks. cwt.	2.00	/ —
l.c.l. wks. cwt.	2.45	/ —
tank-cars, wks. ton	18.60	/ —
Sulphur:		
crude, c.l. mines, contract, long ton	23.50	/ —
f.o.b. vessels Gulf dock. ton	25.00	/ —
Sulphur dioxide:		
liquid, coml. cyl., wks. lb.	.10	/ .12
multi-unit cars, wks. lb.	.0535/	—
Talc, fibrous grd., bags:		
c.l. wks., N.Y. ton	28.00	/ —
l.c.l. wks., N.Y. ton	31.00	/36.00
Titanium dioxide:		
anstase, c.l. dlvd. E. bags. lb.	.25½/	—
l.c.l. dlvd. lb.	.26½/	—
rutile, c.l. dlvd. lb.	.27½/	—
l.c.l. dlvd. lb.	.28½/	—

NEW EQUIPMENT AND SUPPLIES

PVC Valves with Socket Ends

Lunkenheimer Co. has announced the addition of valves with socket ends to its line of Luncor PVC valves. Constructed of polyvinyl chloride, these valves are used where corrision resistance is desired.

Designated as Fig. 2601, the new Luncor socket-end valve is readily installed in PVC pipe lines by solvent welding. This is a fast and easy method of connecting PVC valves to pipe, and produces high joint strength. Solvent cements suitable for joining the new valve and PVC pipes are available commercially. The Luncor Fig. 2601 valve is rated 125 WP and 140°F.

These valves have been particularly successful in handling most common corrosive solutions in industrial operations and chemical processing. The high strength-weight ratio of Luncor PVC valves gives them rigidity comparable to metal.

For detailed service recommendations, write for a confidential corrosion service information form available from Lunkenheimer distributors or from Lunkenheimer Co., P. O. Box 360, Cincinnati 14, Ohio.

Wire Braided Steam Hose For 200-p.s.i. Service

The availability of a wire-braided steam hose for high pressure, high temperature service is announced by Hamilton Rubber Manufacturing Corp. Known as Gibraltar steam hose, it is recommended for saturated steam pressures up to 200 p.s.i. or for handling super-heated steam at temperatures up to 285°F.

This hose is constructed with high quality heat-resisting rubber tube and features two braided plies of high tensile reinforcing wire. These reinforcing wires guard against hose rupture or bursting during operation. A heat, oil and abrasion resisting neoprene cover is inseparably bonded to the wire carcass by a ply of high-tensile, heat-resisting cord yarn.

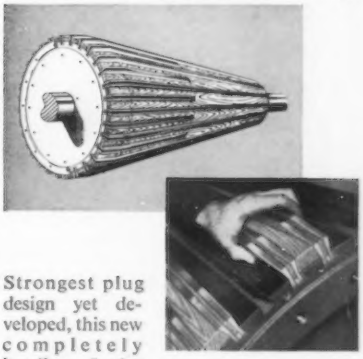
Used for steam handling and steam jenny service, Hamilton Gibraltar wire-braided steam hose is available in sizes from ½ in. I.D. to 2½ in. I.D. These sizes weigh from 62 to 230 lb. per 100 ft.

Additional information on Gibraltar steam hose is available from Hamilton Rubber Manufacturing Corp. Div., Acme-Hamilton Manufacturing Corp., 115 Meade Street, Trenton 3, N.J.

More New Equipment on page 44

TIME FOR REPLACEMENT?

E.D. Jones® Adapta-Plug



Strongest plug design yet developed, this new completely bandless Jordan plug is easiest to strip and fill. New, improved design holds bars firmly in place, eliminates hazards of slot wear and corrosion. Available in solid plug — or sleeve form for easy conversion of old worn plugs. Write for Bulletin EDJ-1094.

E.D. Jones®

FULBAR

SHELL FILLINGS

A complete one-piece assembly, made to fit the shell body of any Jordan. No keys or wedges. Fulbar rigidity and one-piece construction compensate for inequalities in old Jordan shells — save hours of installation time. Many other new advantages make this the ideal shell filling. Write for Bulletin EDJ-1094 and names of satisfied users.

E. D. JONES & SONS COMPANY

Pittsfield, Massachusetts

Builders of Quality Stock Preparation Machinery

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Strap skid loads?

Signode can help you save time, save valuable floor space, and make the strapping operation easier and cheaper. One reason is the Signode AP machine, the only one-piece, air-powered portable strapping machine. For information, see your Signode man or write:

SIGNODE

SIGNODE STEEL STRAPPING CO.

2677 N. Western Avenue, Chicago 47, Illinois

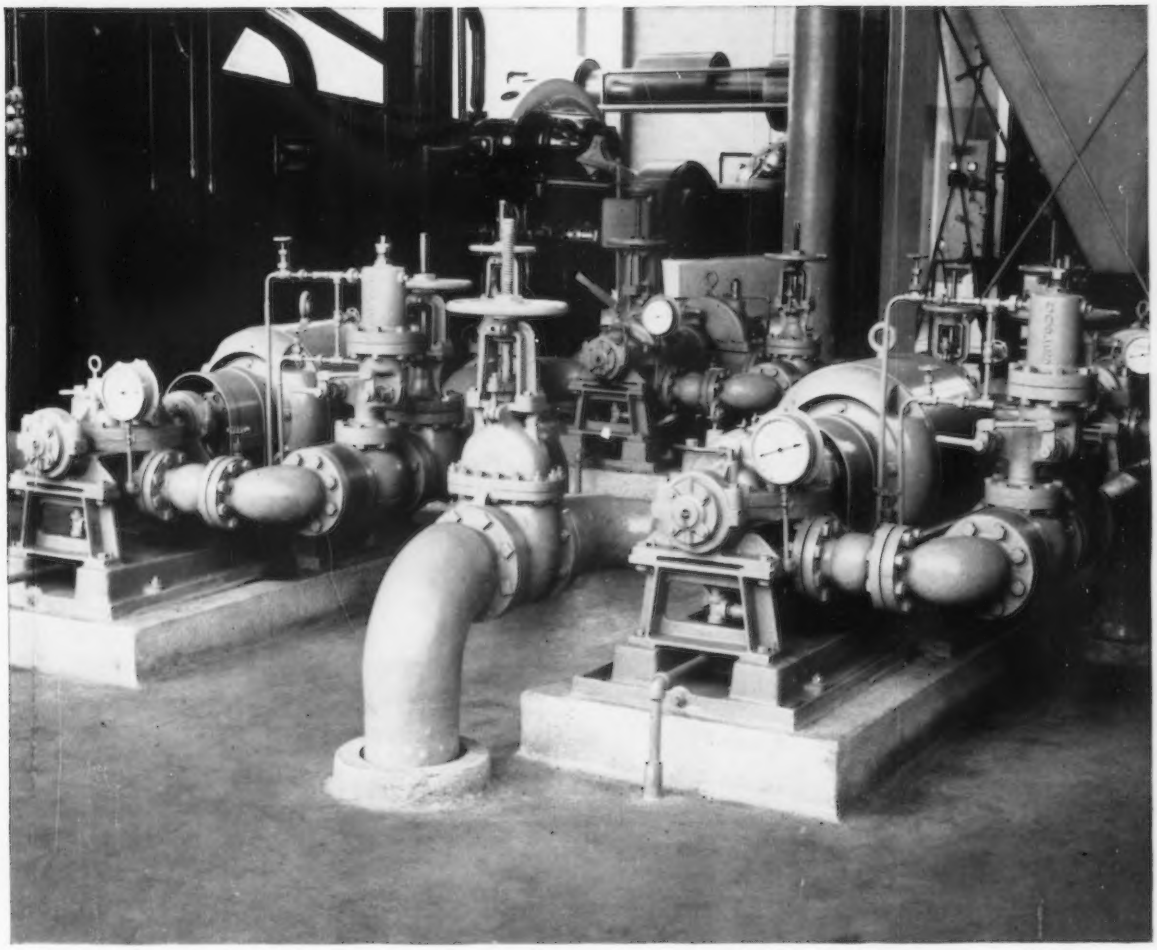
Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide. In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

Over 1,000 years ago a Chinese genius conceived the idea of a mould from which paper could be removed while still moist. The original mould was a "laid" transfer type made of bamboo splints laced with horsehair. The name of the discoverer is lost in ancient China's history—but his discovery was the first improvement in paper making, and the basic principle is used by paper makers today.

Another milestone in paper progress: Dow Latex 512-R

This strong adhesive improves dimensional stability and reduces water sensitivity—and contributes to sharper printing with fracture-free folding. Result: the highest-quality coated stock with important economies. Your Dow man has the complete story. Why not see him soon? THE DOW CHEMICAL COMPANY, Midland, Michigan.

YOU CAN DEPEND ON DOW

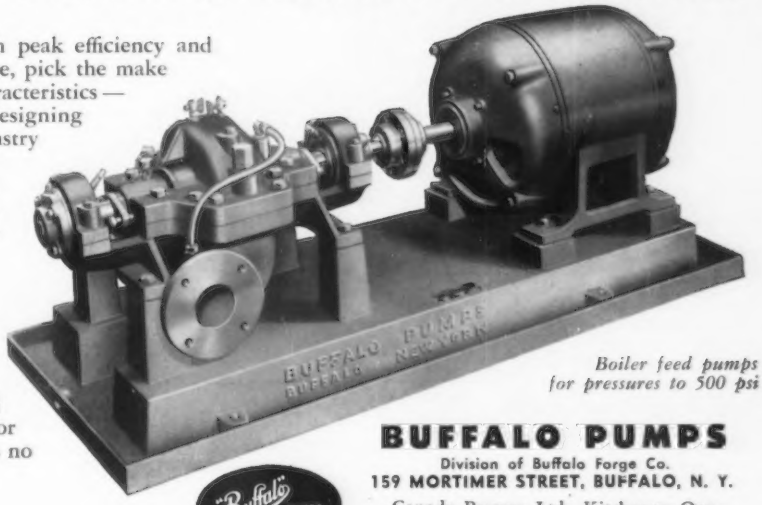


"Buffalo" Type RR Pumps on boiler feed at a large auto plant

"BUFFALO" – THE PUMPS THAT DON'T MIND BEING IN HOT WATER AND UNDER PRESSURE!

In selecting boiler feed pumps of both peak efficiency and year-after-year durability, under pressure, pick the make with the 80-year record for these characteristics — "Buffalo". This long experience in designing and building centrifugal pumps for industry has resulted in present-day "Buffalo" Pumps with every feature for maximum delivery at least power input — and for continuous service with negligible maintenance.

"Buffalo" Type RR two-stage and four-stage pumps have the typically efficient, balanced "Buffalo" impellers — the oversize bearings and shafts — the rugged casings with simply formed water passages and deep 8-ring stuffing boxes. Write for Bulletin 980 and see why we say there's no better buy!

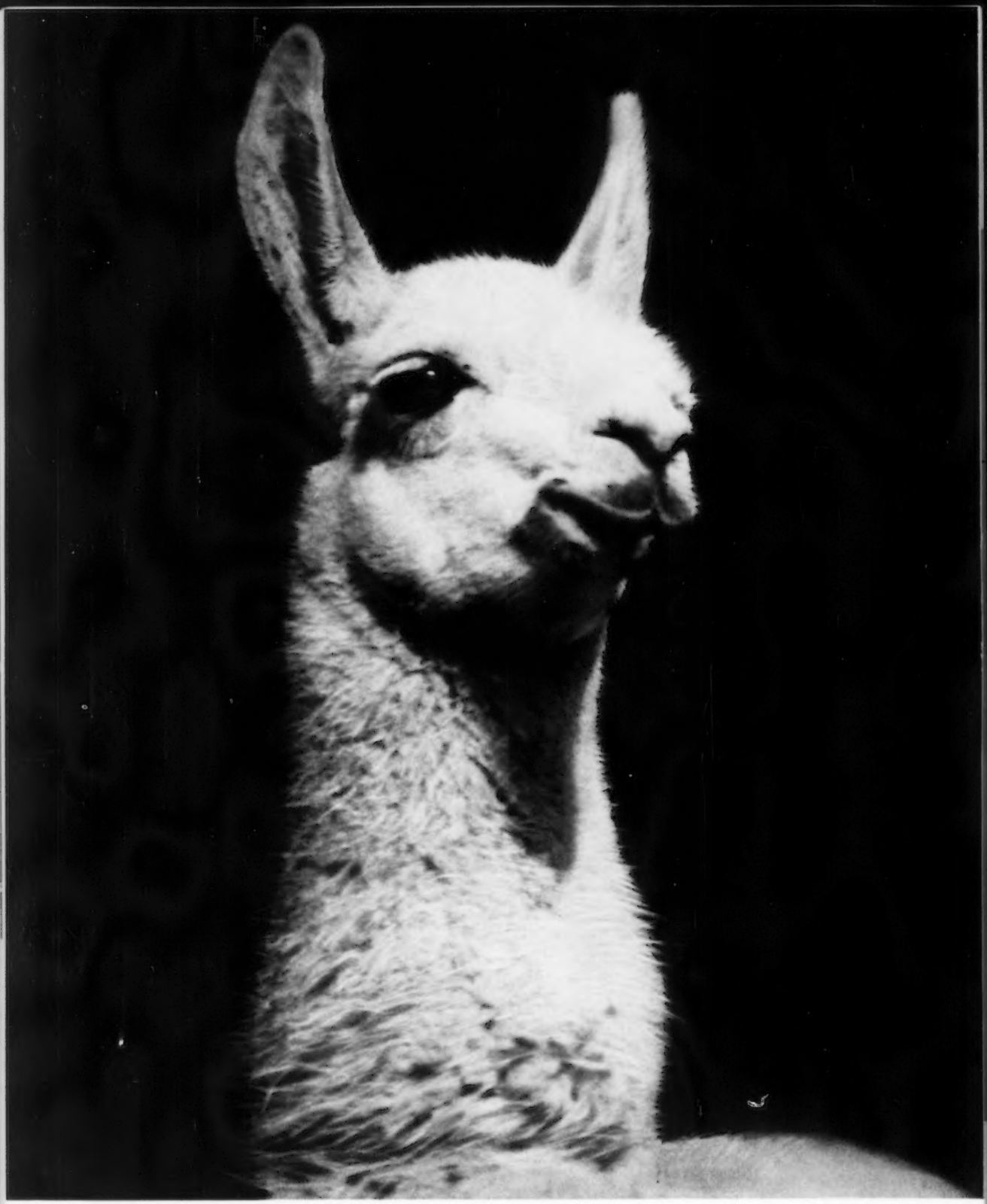


Boiler feed pumps for pressures to 500 psi

BUFFALO PUMPS
Division of Buffalo Forge Co.
159 MORTIMER STREET, BUFFALO, N. Y.
Canada Pumps, Ltd., Kitchener, Ont.
Sales Representatives in all Principal Cities

"Buffalo" PUMPS

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID



Manufacturers of quality papers specify ***Du Pont*** *"*Ti-Pure*" titanium dioxide pigment to add brightness and opacity . . . just as makers of quality printing inks specify Du Pont Pigment Colors for fine reproduction. Reprints of this illustration, suitable for framing, are available on request from your Du Pont Pigments representative.*

Du Pont Pigments add beauty...practicality...versatility

NATURE'S WHITE IS RIVALED BY DU PONT TI-PURE®

Whiter than a white llama... Du Pont "Ti-Pure" gives paper products high opacity and brightness

FEW things found in Nature approach the remarkable whiteness Du Pont "Ti-Pure" titanium dioxide pigments give to paper. Nature likewise falls down on lasting whiteness . . . for her subjects tend to yellow with age. "Ti-Pure" provides your paper products with a durable brilliant white that adds important sales and performance advantages.

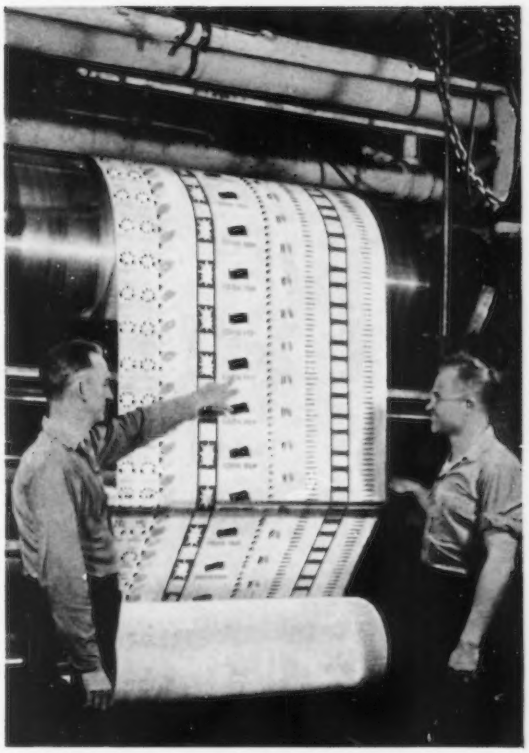
HIGH OPACITY—of interest to the manufacturer of magazine and Bible stocks . . . also important to the converter who is coating kraft board. In the first case, "Ti-Pure" makes possible a lower basis weight sheet without sacrificing opacity. In the second, a clean, white surface is achieved for boxes and cartons . . . a surface that prints clear and sharp . . . wears better, too.

BRIGHTNESS—of "Ti-Pure" is also an important property . . . as well as its resistance to wear and aging. This is especially important with the increasing use of multi-colored printing on labels, cartons and store displays. It is also important in the re-usable multi-unit carton that is frequently exposed to the elements.

STANDARDIZATION—of quality and whiteness is a primary consideration in the selection of pigments for your papers. As a manufacturer of "Ti-Pure" for more than 20 years, Du Pont provides you with pigments of unvarying high quality that meet your most exacting specifications.

Du Pont also offers you technical assistance in its completely equipped paper laboratory on any problems you may have in the pigmenting of your papers. For information, consult your Du Pont Pigments representative or write: E. I. du Pont de Nemours & Co. (Inc.), Pigments Department, Wilmington 98, Delaware. In Canada —Du Pont Company of Canada (1956) Limited, P. O. Box 660, Montreal, Quebec.

In the production of your colored coated papers, too . . . remember Du Pont's line of quality pigment colors.



COLORS on packaging materials sparkle with new brilliance when they are printed on a paper made with "Ti-Pure." Here, "Ti-Pure" exhibits good hold-out power which makes for brighter colors . . . resists shelf aging and weather.

PIGMENTS DEPARTMENT

DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

to fine products everywhere

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Thiele Kaolin

HIGH QUALITY PAPER CLAYS

- Controlled Particle Size
- Uniform Low Viscosity
- Excellent Color
- High Brightness

Write for full information and sample of Thiele Kaolin coating or filler clay for your particular use.

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P. O. BOX 270 · SANDERSVILLE, GA.

For the paper industry...

There's MORE continuous processing with Allis-Chalmers MOTORS

Maximum protection against moisture, acid, alkali, and excess grease is built into the Allis-Chalmers line of totally-enclosed chemical motors. This results in fewer motor stoppages, uninterrupted processing, and more profitable mill operation.

Special safeguards against breakdowns are standard on Allis-Chalmers rib-type chemical motors:

1. All external stationary parts are of cast iron.
2. A cast bearing cap is used on the inner side of each ball bearing.
3. A moisture-proof compound seals the leads where they come through the motor frame.

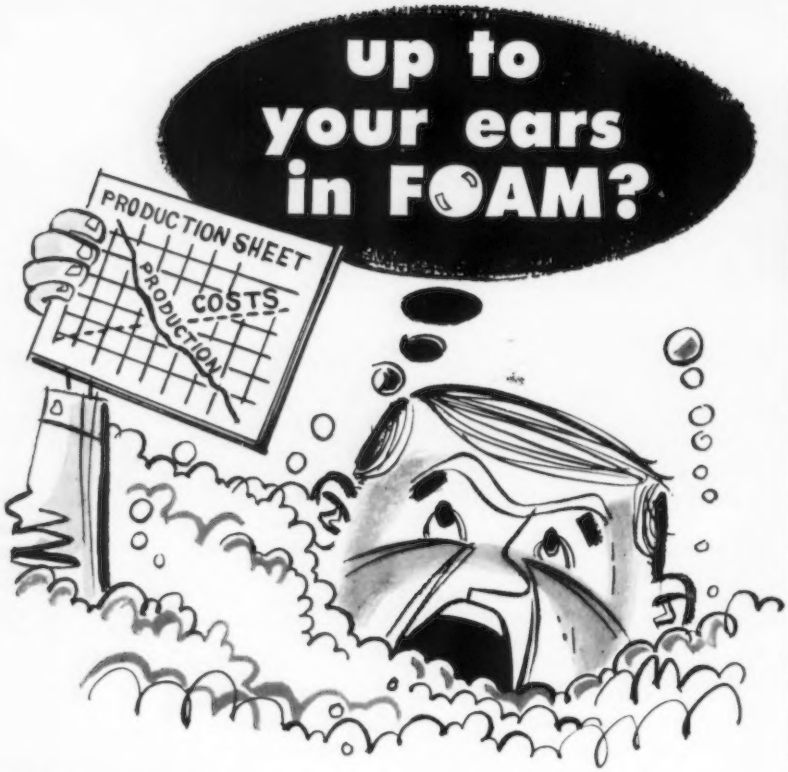
Find out more about the "MORE" in Allis-Chalmers motors by contacting your nearby A-C office or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

For Fast Delivery, check Allis-Chalmers first! Chemical motors are available in all totally-enclosed designs. Shown here are two 7½-hp units driving caustic soda delivery pumps in an eastern paper mill.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-5165



then change to a Dow Corning SILICONE DEFOAMER

Why continue to let foam rob you of valuable processing space, inflate your costs, smother your production schedule? Why indeed when only a teaspoonful of a Dow Corning SILICONE DEFOAMER will prevent mountains of that wasteful foam . . . help you operate at full capacity.

ANTIFOAM B is the lowest priced, easiest-to-use silicone defoamer ever developed. Ready for instant use, water dilutable Dow Corning Antifoam B disperses immediately, will not cream or separate. Just try it—you'll see!

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Put Dow Corning SILICONE DEFOAMERS to the test. Use the coupon below or write on your letterhead to receive a free trial sample. No obligation, of course.

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MIDLAND, MICHIGAN

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NAME _____

TITLE _____

COMPANY _____

CITY _____ ZONE _____ STATE _____

My foamer is

Oil system _____

Aqueous system _____

Other _____

(New Equipment and Supplies continued from page 41)

Improved Lift Truck Paper Roll Clamp

The development of an improved paper roll clamp attachment for lift trucks, designed to give a greater equalization of clamping pressure on the roll, has been announced by Yale Materials Handling Division, Yale & Towne Manufacturing Co.

It is claimed that this even distribution of the holding force permits faster handling of rolls of paper by making it easier to obtain a positive, safe grip on the roll. Dual, ten inch long by eight inch wide, pads on each arm of the attachment distribute the clamping pressure evenly along the sides of the load. The portion of the clamp arm between the two pads is slotted to give a small degree of flexibility in the arm itself which further aids in the equalization of pressure.

The new Yale clamp can handle rolls ranging from 10 to 60 in. in diameter. Rolls from 28 to 60 in. in diameter can be handled with clamp arms in the normal position. A simple mechanical adjustment of one arm permits handling of smaller rolls.

Each arm of the clamp is individually controlled permitting lateral adjustment and a sideshifting effect when handling rolls of less diameter than the maximum clamp range.

The load can be maneuvered out of tight places by resting it on the floor or another load while one arm is extended to its lateral limit and then the other used to shift the load and restore clamping pressure for lifting.

The new Yale attachment is built in capacities from 1250 to 6500 lbs.

OBITUARIES

Franklin R. Hoadley, Sr., 67, a retired president of Farrel-Birmingham Co., Inc., Ansonia, Conn., and a former president and treasurer of Atwood Machine Co., Stonington, Conn., died of a heart attack on September 12 at his home in Stonington.

He was the son of the late Frank Edgar who had been secretary of the Farrel firm, his period of employment with it extending over more than fifty years. His grandfather, Robert Hoadley, also was connected with the company.

John M. Goldsword, 76, for the past three years chairman of the board of the Globe Paper Co., Cleveland, Ohio, died September 4.

Mr. Goldsword has been associated with Globe 63 years and had been president of the firm for many years before he became chairman. The company was founded 65 years ago by an older brother, the late Edward C. Goldsword.

Walter Roller, 61, a processing engineer for the Kimberly-Clark Corp.'s Kimlark Mill, Neenah, Wis., died September 15.

Philip J. Wenz, 63, manager of the Service and Repair Division of De Laval Steam Turbine Co., Trenton, N.J., died September 11 after an illness of several months.

Edwin Stanton Hooker, 75, retired general manager of the Tyrone, Williamsburg and Luke, Md., plants of the West Virginia Pulp & Paper company, died September 9 at his home, Tyrone.

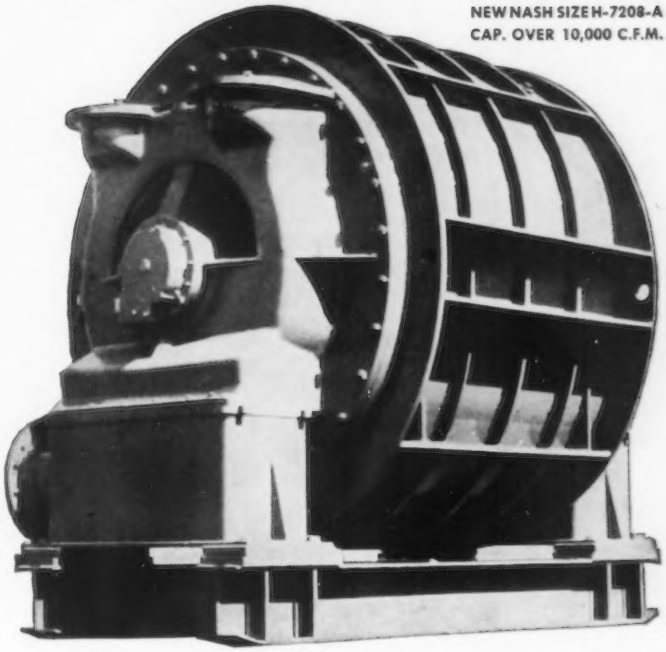
Mr. Hooker, who retired in 1946, began his 47-year career with West Virginia April 3, 1899. In 1927 he was named manager of the two Blair county mills and in 1929 the managership of the Luke, Md., plant was added to his duties.

Mr. Hooker also served as a member of the board of directors of the company during his tenure as manager.

Harry W. Huntsman, 51, resident manager of the Los Angeles plant of Western-Waxide Division, Crown Zellerbach Corp. died September 16.

Mr. Huntsman joined Western-Waxide in Los Angeles in 1930 as a clerk. He became sales manager of the Los Angeles plant in 1945, and in 1953 was named assistant manager and sales manager of the San Leandro plant. He was transferred to Los Angeles in 1955 as resident manager.

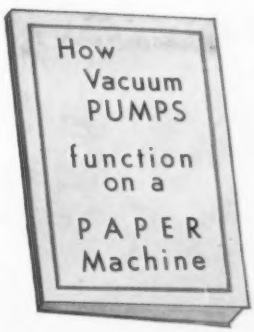
NEW NASH SIZE H-7208-A
CAP. OVER 10,000 C.F.M.



If three days lost production on a paper machine amounts to more than the cost of Vacuum Pumps, dependability is the prime factor in pump selection.

Over a thousand leading mills depend on Nash Vacuum Pumps to insure continuous production. Nash Pumps are built sturdy enough to stand the pounding of continuous production. They are simple. They have no internal parts in wearing contact. They will handle slugs of water or stock. They are designed to operate at the low speeds necessary for long life and reliability. Don't gamble with your production. Install Nash Vacuum Pumps and be safe.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONN. U.S.A.



Of equal interest to Management and to Machine Operators is this informative booklet just published. A copy will be mailed to you free upon request.

Name_____

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Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as percent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1957	Aug. 17 91.3	Aug. 24 91.8	Aug. 31 89.2	Sept. 7 71.1r	Sept. 14 90.0
1956	Aug. 18 96.2	Aug. 25 96.9	Sept. 1 97.0	Sept. 8 76.8	Sept. 15 98.8

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1957	93.9	96.5	96.6	93.3	93.6‡	92.5‡	74.9‡	90.5‡					
1956	**99.6**	**102.6**	**102.9**	**102.5**	**101.8**	**99.9**	**85.6**	**96.7**	**94.3**	**99.5**	**97.6**	**90.9**	**97.9**

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1950	1951	1952	1953	1954	1955	1956	1957
Year to Date	95.1	99.2	90.4	92.6	91.2	94.4	98.2	91.1
Year Average	95.8	98.0	88.6	92.3	91.6	94.9	97.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

COMPARATIVE WEEKLY SUMMARIES

1957	Aug. 17 94	Aug. 24 95	Aug. 31 95	Sept. 7 72	Sept. 14 98
1956	Aug. 18 95	Aug. 25 94	Sept. 1 95	Sept. 8 71	Sept. 15 97

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1957	91	94	94	92	93	91	72	94					
1956	100	100	99	100	99	98	77	95	89	96	93	84	94

† *Percents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING Sept. 14, 1957	LAST WEEK ENDING Sept. 7, 1957	CUMULATIVE TO DATE Jan. 1 to Sept. 14, 1957
% Activity	98%	72%	90%
	Tons	*Tons*	*Tons*
Total Production	299,482	214,792	9,869,358
Liner	103,652	69,423	3,385,737
Corrugating Material	45,108	32,312	1,503,165
Chip & Filler Board	4,662	4,872	193,532
Total Containerboard	153,422	106,607	5,082,434
Folding	56,902	41,935	1,825,097
Set-Up	12,342	10,127	402,427
Special Food Board	24,767	17,740	876,879
Other	52,049	38,383	1,682,521
Total Boxboard	146,060	108,185	4,786,924
Total Orders	*Tons*	*Tons*	
Received	265,697	339,419	
Unfilled End of Week	504,557	540,109	

Alvin H. Johnson & Co.

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Consulting and Designing Paper Mill Engineers

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PAPER MILL DESIGN PROCESS ENGINEERING POWER PLANTS

STRUCTURAL AND ARCHITECTURAL DESIGN

REPORTS APPRAISALS ESTIMATES AND SURVEYS

NEWS OF SUPPLIERS

R. W. Bond

A. Schwarzenberg

Corn Products Sales Co. has named Robert W. Bond manager of the Sales Service Department. Before going to New York to assume his new responsibilities, Mr. Bond served four years as manager of the Technical Sales Department at the company's Argo, Ill. plant.

John W. Bolton & Sons, Inc., Lawrence, Mass., pulp and paper mill equipment and machine knife manufacturer, has promoted three to sales office posts in a move designed to broaden the scope of services to customers of Bolton and its Emerson Division.

Arthur G. Schwarzenberg is made Manager, Customer Services in which position he will supervise the Lawrence office sales activities.

In sales auditing posts John A. Pearson will work on Emerson products, and Howard Dyke on the Bolton product group.

H. K. Porter Co., Philadelphia, Pa. has appointed Thomas J. Gorman director of purchases, Quaker Rubber Division. He has been with Quaker since 1939, for the past ten years has been chief chemist.

Rust Engineering Co. has elected Arthur M. Over a vice president. He had been a project manager and formerly had served as director of purchases from 1952 to 1955.

Allis-Chalmers Manufacturing Co. has announced the formation of Allis-Chalmers International as a major operating division.

P. F. Bauer, formerly general manager, Industrial Equipment division, has been named managing director of the new division. Paul Dietz and Floyd J. Mischke were named its associate directors of sales.

Farrel-Birmingham Co., Inc. has appointed Robert J. Horning manager of Roll Grinder Sales to succeed Harlan J. Hauser, who has been made assistant sales manager of Consolidated Machine Tool Division at Rochester, N. Y.

Mr. Horning will make his headquarters at the company's home office at Ansonia, Conn. For the past year, he has handled roll grinder sales in the New England territory, and for several years prior to that was sales representative for the Consolidated Division's line of machine tools.

American Cyanamid Co., has announced the retirement of Herbert S. Morrow, its veteran executive and in recent years a consultant to Cyanamid's Fibers and Organic Chemicals Division.

From 1935 to 1945 Mr. Morrow served as technical service manager of Cyanamid's Calco Division at Bound Brook, N. J., and in the following seven years was in charge of sales promotion for the Division, with headquarters in New York. From 1952 to 1956 he was consultant to the Dyes Department of Cyanmid's Organic Chemicals Division, and during the past year he has been a consultant to the company's Fibers Division.

American Manganese Steel Division of American Brake Shoe Co. has appointed Stanley Marwin assistant works manager of the Los Angeles plant. Mr. Marwin has been with American Manganese since 1934, and has held numerous positions in production and supervision at various plants in the division.

James Flett Organization, Chicago, Ill., has elected Philip M. Kolb as a director of the organization. Mr. Kolb has been advanced from the position of vice president in charge of operations to executive vice president in charge of operations and all branch offices.

Stein Hall & Co.'s technical division announced that amylose and amylopectin, the principal components of potato starch, are being marketed by them in commercial quantities in the U. S. for the first time. Through an agreement with AVEBE (Coop. Verkoop-en Productievereniging van Aardappelmeel en Derivaten "AVEBE" G. A.) of Veendam, The Netherlands (leading manufacturers of potato starch in Holland), Stein Hall has acquired exclusive sales rights in the United States and Canada on amylose and amylopectin.

A. H. Cooper

H. Schweinsberg

American Industrial Chemical Co. has named Dr. Albert H. Cooper general manager. The company is a division of Amerace Corp. One of the country's acknowledged top authorities in the field of silica gels and silicates, Dr. Cooper directed the development of the unique new continuous process now producing silica gel and other silicas at the company's new plant in Butler, N.J.

Harbison-Walker Refractories Co. has appointed Harry S. Schweinsberg assistant general sales manager. Sales manager of the company's Philadelphia district since 1948, he now will maintain headquarters at the home office in Pittsburgh, Pa. Mr. Schweinsberg has been with Harbison-Walker in various sales capacities since 1924.

You profit by our . . .

KALAMAZOO TANK & SILO CO.

90 yrs.

1867 . 1957

. . . in business

To twist a phrase, the first 90 years are the hardest. In that time we may not have found all the answers on engineering, materials, and construction of tanks, silos, and storage tanks but we've got most of them. Consequently you profit most by these 90 years when you bring your business to us.

So thanks for the many successful and happy years in business . . . if you have a specialized building program or problem, give us a call. Let's start the next 90 off on the right foot . . . for both of us.

Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

R. Halsted

E. H. Baxa

Allis-Chalmers Manufacturing Co. has appointed Robert L. Halsted general manager of its Industrial Equipment Division. He succeeds P. F. Bauer, recently named managing director of Allis-Chalmers International, a new operating division.

Edward H. Baxa becomes manager of Allis-Chalmers processing machinery department, succeeding Mr. Halsted.

Geigy Dyestuffs, Division of Geigy Chemical Corp., Ardsley, N. Y. has announced the appointment of Herman L. Steen as sales manager for that division. He has been with Geigy for 22 years, most recently as branch manager in Philadelphia. That position has now been assigned to F. W. Allendorf.

Comparative Study of Linings

(Continued from page 33)

coverages of both fired and unfired pressure vessels recognize this fact, and have on occasion insured pressure vessels which had not been stress relieved. However, the B.C. Provincial Code requires stress relieving of all digesters, and so we must abide by the regulations.

There is, however, a recognized method of stress relieving at temperatures below 400 degree F. developed in the United States about the end of the war that has been approved by the Provincial authorities. By use of this method, it is felt that one of the major factors responsible for the poorer service records in this country will be overcome. This method was sanctioned when structural changes to the shells of the five brick-lined Prince Rupert digesters were made in 1952, and also was used on the high head Kemano penstock for the Aluminum Co. installation near Kitimat. Dominion Bridge has used the method successfully. The procedure is not difficult nor costly to carry out since it does not entail special housing or expensive heating equipment. The stress relieving can be done on the site without interference with the erection crews. The act of stress relieving a welded joint is a continuous operation carried out at a definite rate of travel in feet per minute, depending on the thickness of the plate on which the weld was made. Complete information is available on the procedure.

I feel very strongly about this point, and rate it as of major importance. By avoiding carbide precipitation and maintaining the maximum corrosion resistance adjacent to the welds, it will likely contribute to reduced digester maintenance.

Design of Upper Dome

In this country several stainless-lined digesters have experienced the greatest corrosion in the upper dome section. In attempting to find a logical answer why this should be, I can visualize one factor that may contribute to the condition. In the flat section of the upper dome, vapour can condense and because of the small gradient, the surface tension is enough to keep the droplet from running down the side. In the new digester that we have proposed, the upper dome has an included angle of 95 degrees. It is my opinion that this slope will cause the condensed droplets to continuously slide down and keep the surface clean. A point in favor of this reasoning is that the vertical top strainers of type 316 do not suffer any attack in our present digesters, while the more horizontal Hastelloy F material has required some patching.

The loss in digester volume is very small, and because the radius of the knee is identical with the bottom cone, some small economy is effected.

CONCLUSION

It is my sincere hope that the points discussed so briefly in this paper can be of value to the pulp and paper industry as a whole.

I seem to have been very unfortunate in mill associations as far as digesters are concerned. I was intimately connected with a very early installation of an accumulator and hot acid system in which we had some corrosion problems, then for a number of years with a large kraft mill that had the questionable distinction of the highest digester corrosion rate in the industry, and now again with a mill having a history of unusual and costly experiences with sulphite digesters. My ill fortune along these lines also has a bright side: it has given me an opportunity to study a problem that has been of great interest to me over the years. I hope that my experiences may prove of help to others.

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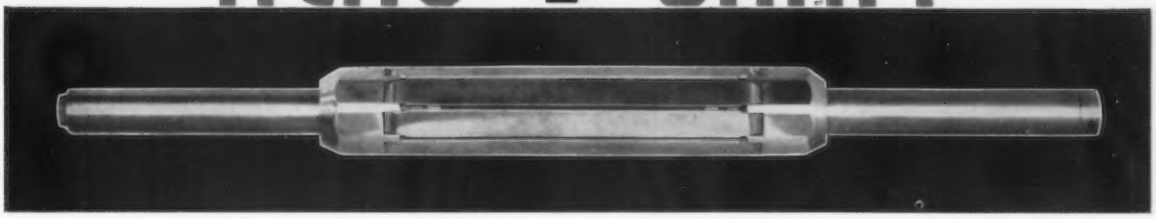
CHEMICAL PROCESS SYSTEMS — REFINERIES — SEWAGE SYSTEMS

the Pneumatic expanding Core Shaft

AERO ® SHAFT



. . . non-slip grip releases instantly for removal

This cost-cutting tool saves time and labor. Aero-Shaft holds cores with a non-damaging, non-slip grip . . . but slips out or in easily by means of an instant-action release valve. No more hammers or wedges!

Compressed air presses 16 smooth steel edges firmly against core with a uniform tension that makes possible faster roll speeds, eliminates breaks due to core slippage. Press the release valve and tube deflates, so Aero-Shaft slips out or in easily. Double expanding rib section available for web widths over 40". Write for literature and prices . . . start saving now!

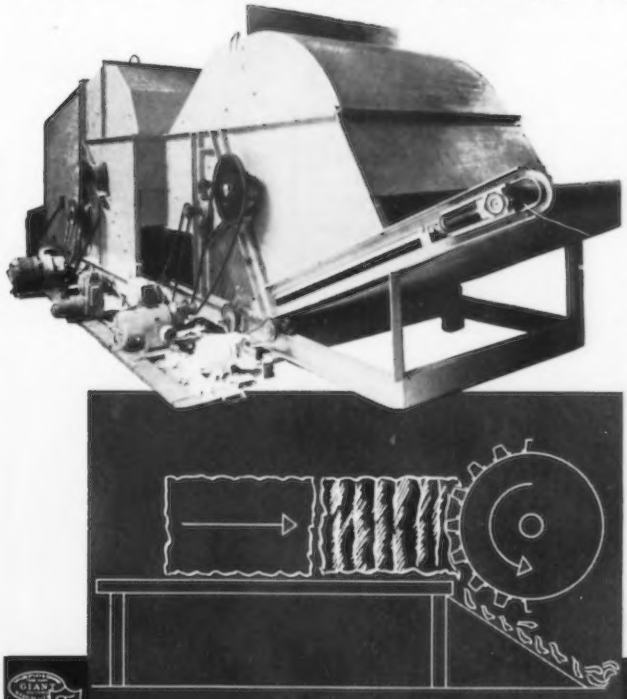
printing presses, rewinders, embossers, folders,
napkin and core machines and special converting machines

PAPER CONVERTING MACHINE COMPANY

GREEN BAY, WISCONSIN

PCMC

DO IT AUTOMATICALLY!



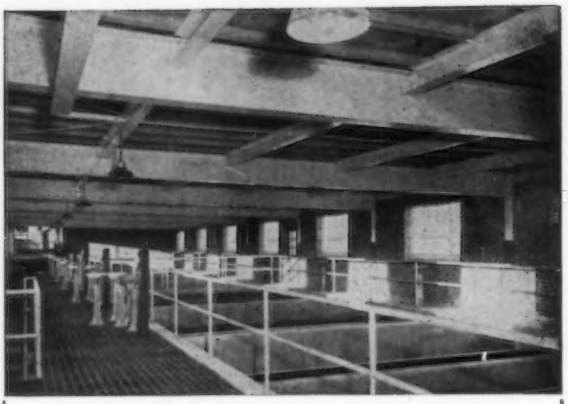
Open and feed 15,000 to 25,000 pounds of rags an hour with this newly designed Taylor-Stiles Opener-Feeder. With this system, the bales, held on a fork lift truck while wires are cut and removed, are placed on the feed conveyor. The conveyor pushes the bales against the first of a pair of revolving cylinders which open the bale and spread the rags and deliver them uniformly to the discharge apron. From here they go to the cutter conveyor—or if preferred, to a sorting conveyor—or if preferred, to a sorting apron, and then to the cutter feed. Net result: You get a uniform hourly rate of feed and cutting from the improved Taylor-Stiles cutter, varying from 15,000 to 25,000 lbs. an hour, depending on the capacity of the cutter used—and this is all done AUTOMATICALLY!

Our new Taylor-Stiles Cutter, used in conjunction with the New Automatic Bale Opener, contains the new features which make for a more uniform, faster cutting operation with fewer shutdowns and less maintenance. The new design of this cutter also minimizes the jamming of rags. The shear cutting principle embodied in the design and construction of Taylor-Stiles Cutters produces a smooth, shearing action which does a superior cutting job with less power.

Write today for folder 214 with complete information regarding our new automatic bale-opener-feeder and the improved Rag Cutter.

TAYLOR, STILES & CO.

10 BRIDGE STREET RIEGELSVILLE, N. J.



Concrete Gravity Air-Water-Wash type water Filtration Plant producing, at low cost, water with turbidity 0, color under 5 and iron 0.05 p.p.m. Fe.

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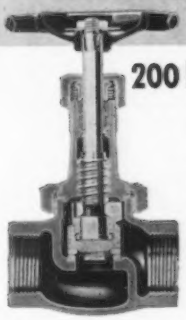

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2—32" Kidder, 4 color Flexographic presses
1—Koenig-Bauer 5 color Rotogravure press. Reliance drive.
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1—50" Miller Single Color #W102 Gravure press
1—42"—4 color Cottrell-Heinrich Flexo, press on 6-color frame, suitable for cellophane
1—48" 6-color Heinrich-Cottrell Press. 4-Flexo—2 Rotogravure.
1—31" two color Wolverine Flexo-Printer
1—2-Color #4 Keese Perfect Seal press
1—25" Aniline press, 4 color on 8 color frame
Tail Printers: 35½" & 29" wide 3 color, 21" & 25" wide 2 color
1—2 color 9" wide Schmutz Kraft Paper Tape Printer, with adjustable cyls.

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Seybolds: 56" & 64" Precision; 50", 56" & 65"—10Z; 84" Dayton; 60"-20th Century; 65" Holyoke. Sheridan: 36" new model, Oswego: 44", 38", & 34", 54" heavy duty.

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1—92" Model 18
1—82" Model 10-10A
1—72" Type 10-11
1—72" Type 10-10
1—62" 26-2A
1—50" 26-3A with C.T. & Elec. Eye
1—42" and 1—62" Type 6
1—42" Type 9-5-A Roller Bearing 1500 fpm.
1—42" Type 10-5A, 30" rewind 1500 fpm.
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1—90" Kidder Superspeed 40" Rewind
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2—24", 1—30" & 1—36" Kidder S.L. Shear cut

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1—24" Waldron Reverse Coater
Schultz Automatic Roll machines, 12", 18" & 24" wide.
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1—36" Beck Model CSH with General Electric eye
1—36" Beck Model CSH Sheeter with Automatic Piler
1—36" Beck Sheeter Model CCSH, suitable for cello.
1—Hudson Sharp 2 Web Napkin machine, embossing attach., 13½" to 18" napkins
2—Hudson Sharp Single Fold Interfolding Towel machines
1—40" and 1—50" wide
2—81" Dietz Standard Toilet Paper Converters
Die Presses: 1—50" x 22" Type UA, 2—17" x 42" Seybolds
1—48" Moore & White Sheeter with backstands & layboy
2—40½" Hudson Sharp Interfolding Tissue machines
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4—Roto PO-2 Poly-bag machs.
1—Roto Model C Cellophane Bag machine
1—Matador Bag machine, Length 3½"—10½", Width 1⅝"—6".
4—Simplex #7 Poly-bag machs.
1—Holweig F&S Bag machine. Range: 2½" to 11" wide, 6" to 19" long
1—Strachan & Henshaw Bag machine Model 200V with 2-color tailprinter.
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1—Valley Iron Wks. 750 lbs. Iron Tub.

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1—Sandy Hill 84" 7 roll with doctors.
1—Lobdell 82"—5 roll.
1—Lobdell 86" five roll.
2—Lobdell 86"—7 roll.
1—Farrel 152"—frames for 11 rolls with 5 rolls.
1—Downingtown 128" 7 roll, complete.
1—B & C 124" 5 roll.
1—B & C 124" 7 roll.
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1—92" face x 30" dia.
1—102" face x 36" dia.
1—136" face x 54" dia. stainless steel covering.
2—74" face x 36" dia.
2—73" face x 48" dia.
1—72" face x 48" diameter.
2—104" face x 36" diameter.

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2—42" face x 36" dia.
2—44" face x 36" dia.
2—46" face x 16" dia. & accessories.
2—46" face x 36" dia.
40—46" face x 24" dia. chrome plated & accessories.
58—46" face x 48" dia. chrome plated & accessories.
1—67" face x 36" dia.
1—68" face x 36" diameter.
2—70" face x 36" dia. with gears.
8—72" face x 36" dia. with AF bearings.
1—74" face x 36" dia. Lukenweld—A.F. Brgs.
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1—82" face x 48" dia., gears & bearings.
2—84" face x 28" dia.
2—88" face x 36" dia.
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13—90/ face x 48" dia. with gears & bearings.
1—104" face x 36" dia.
1—104" face x 48" dia.
1—110" face x 42" dia.
1—120" face x 42" dia.
1—124" face x 48" dia.
1—126" face x 48" dia.
17—127" face x 42" dia.
1—130" face x 48" dia.
1—138" face x 36" diameter.
2—160" face x 28" dia. with rope carriers.
10—160" face x 36" dia.
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1—80" Hudson Sharp Roller Bearing equipped. Complete from unwind through rewind including drive.

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2—Dowingtown 24" diameter x 128" face, A.F. brgs. with 19" diameter rubber top roll & complete frame work.
1—Extractor roll section—Complete 1—22" dia. x 136" face suction extractor roll; 1—24" x 134" plain extractor with 18" x 136" R.C. couch roll.

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1—Oliver continuous filter, cylinder 8 ft. diameter x 10 ft. face, steel vat. Used 2 months.

FLAT SCREENS

1—Impco 10 Plate—Dunbar drive, bronze vat.
1—12 plate Sandy Hill, Roller Shoe.
1—Bird Johnson S. S. screen 2 H.P. motor.

JORDANS

1—Appleton #2 anti-friction bearings.
1—E. D. Jones pony Jordans S. S. fillings.
1—Smith & Winchester with granite filling.
2—E. D. Jones standard with A. F. bearings.
1—E. D. Jones #4 (Imperial) with A. F. brg.
2—Shartle #1 Miami.

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Valley Iron Wks. pulp test equipment consisting of couch roll, sheet mould, hydraulic press, hot plate with boiler. Like new condition.

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1—300 H.P. West. 388 RPM, 440-3-60.
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3—GE 150 H.P. 3/60/440—435 R.P.M.
3—GE 100 H.P. 3/60/440—435 R.P.M.
1—GE 100 H.P. 3/60/440 695 R.P.M.

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3—2 ft. x 8 ft. type 300 Tyler Niagara chip screens.
1—Jones pulp screen. Cylinder 40" dia. x 83".

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1—Farrel-Birmingham. Complete with crowning device and motor drive. For rolls 30" x 160"

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7—R.C. Couch 18" dia. x 132" face with brgs, frames, etc.
4—Sets primary presses 12", 14" & 16" dia. x 128" face. Bottom rolls bronze. Top rolls R.C.
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1—Set B. and C. Crownless deflectionless main press rolls 22" dia. x 128" face R.C. Complete with A.F. brgs, framing, Foxboro Controls & rt. angle drive with clutch & pulley.
1—Set Smoothing Presses, 202" face. Top roll RC 26" diameter, Bottom Roll Chrome plated 24" diameter. Complete with stands, etc.

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3—#2A Bird with copper vats.
4—#3A Bird Model 100. All non-ferrous.
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1—Bird #6 Saveall complete with couch.

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1—B.C. 80" heavy duty Duplex board sheeter with 6 roll backstand and two Reeves drives.
1—Beck 54" with layboy and backstand.
1—Cameron 124" quick change double slitter assembly for board sheeters.
1—Dowingtown 124" heavy-duty duplex board cutter.
1—Hamblet 55" with 3 roll back stand.
1—Hamblet 100" single knife with 3 slitters. Very heavy duty.
1—Hamblet 110" single knife sheeters.
1—M & W 80" with layboy.
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SHREDDERS

2—Mitts Merrill air fluff paper shredders.
1—Taylor Stiles giant stock Shredders, style 36.

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2—Shultz 12" coreless rewind.
1—Schultz 18" automatic with motor.
1—Fales 40"—1" and 1½" knife set-ups.
2—Essex 42" center wind—30" diameter duplex.
3—Cameron 42" model 6.
1—Cameron 52" Model 24-3A, duplex rewind.
1—Langston 60" Shear Cut Slitters.
1—Hudson Sharp 60"—for plastic coated papers.
1—Cameron 62" Model 6-30" rewind.
2—Cameron 62" Model 6. 24" rewind.
1—Hudson-Sharp 72" high speed automatic wax roll and tissue roll converter.
1—Cameron 72" model 10—14 heavy-duty—60" rewind.
1—Cameron 92" model 18—60" rewind, change, constant tension and roll ejector.
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STEAM JOINTS

40—Shartle Bros. steam joints with syphon pipes, for 8" journals, operated at 50 lb. S.P.

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1—De Laval 100 H.P. Complete incl. reducer, governor, etc. Ratio 11.66—1.

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6—Brass for 94" wire.

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1—Sandusky 22" diameter x 135" drilled face.
1—Sandusky 18" diameter x 116" drilled face.
1—Sandusky 25" diameter x 122" drilled face.
1—Sandusky 18" diameter x 122" drilled face.
1—Millspaugh 30" diameter x 192" drilled face.
1—Sandusky 94" drilled face x 18" dia.
1—Sandusky 98" drilled face x 18" dia.

SUCTION PRESS ROLLS

1—Millspaugh 30" dia. x 194" drilled face.

SUPER CALENDERS

1—Norwood 30" 5 roll complete with motor drives.

THICKENER

1—Thickener, cylinder 72" face x 36" dia. Complete with R.C. Couch.

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1—Seybold 84"—Dayton with motor.
1—Seybold 72" 20th Century.
1—Seybold 45" model 10 Z.
1—Seybold 56" Dayton with motor.
1—Seybold 74" 20th Century rebuilt.

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1—Nash #6 Hytor.
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2—Valley Iron Voith Inlets, 86"—Brass lip, stainless steel apron.
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1—New Valley Iron Works 156" x 36" monel lined inlet and head box.
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1—Beloit 10' diameter x 132" face 35 #S.P.
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ADDRESS BOX 57-253 CARE PAPER TRADE JOURNAL. O-21

MASTER MECHANIC

A leading national organization with a cylinder board mill located in Northern New Jersey seeks a competent Master Mechanic. Must be fully experienced in all phases of paper mill maintenance. In reply submit personal data and previous record of employment. Employment will be dependent upon past experience and its confirmation.

All replies held confidential. Address Box 57-260 care of Paper Trade Journal.

S-30

ENGINEERS

Large completely integrated Kraft Paper Mill in Florida seeking graduate:

Mechanical Engineer with minimum of 5 yrs. experience; Project Chemical Engineer with 3 to 5 yrs. experience for Mill Operating Problems; Chemical Engineer—Research and Development; Chemists—No prior experience necessary.

Please submit detailed resume of experience, education, and salary requirements, and personal data. Replies will be held in strict confidence to Box 57-277 care Paper Trade Journal.

O-14

A leading chemical manufacturer has an opening in his paper laboratory for a paper school graduate, or chemist with ChE or BS degree with paper mill experience. The position involves application of new and existing products to manufacture of paper and paperboard. Experience in coatings helpful, but not essential. Opportunity given to assist in supervision of laboratory located in Midwest. Send resume of education and experience, along with salary expected to: Director of Paper Laboratory, Post Office Box 5670, Chicago 80, Illinois. All replies kept confidential. O-14

WANTED—MACHINE TENDER for 6 cylinder board machine. Hospitalization, vacation and good pay. Age preference 25 to 40. Address: American Paper Products, Inc., Box 1058, Lancaster, Pa., Phone: Express 44932. S-30

POWER AND RECOVERY SUPERINTENDENT

Competent to operate 9000 KW Power Plant and 150 ton Recovery Plant.

For new Pulp Mill in Cuba. Pleasant tropical home surroundings. Good American schools. Immediate salary increase commensurate with ability and experience. Please submit complete resume of training and experience. Your reply will be kept strictly confidential.

Address Box 57-279 care Paper Trade Journal.

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IF YOU ARE A TOUR BOSS OR AN EXPERIENCED MACHINE TENDER WITH ABILITY AND AMBITION TO BE A TOUR BOSS WE HAVE AN OPENING. PROGRESSIVE TWO MACHINE BOARD MILL IN EASTERN PENNSYLVANIA. MANUFACTURING SET-UP AND FOLDING BOX BOARDS AND SPECIALTIES. STEADY EMPLOYMENT. IF AVAILABLE, WRITE BOX 57-276 PAPER TRADE JOURNAL, GIVING EXPERIENCE AND AGE. O-14

Assistant Paper Mill Superintendent for Three Machine Mill, making Waxings, Tissues, Towelling, Napkins and Dry-crepe Toilets. Must be experienced on high speed Yankee Machines. Give age, experience, marital status and expected salary in reply to Box 57-278, Paper Trade Journal. S-30

Situations Wanted

WANTED — A POSITION
AS CHIEF POWER ENGINEER or POWER PLANT SUPT.

Twenty-two years experience in Power Engineering including high-pressure plants. Now in charge of a plant with 9,000 KW generating cap. Have a very good technical education in engineering and have a first class engineer's license. Address Box 57-266 care Paper Trade Journal. O-7

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1—145" Holyoke—9 roll Super Calender Stack.

1—66" Holyoke—9 roll Super Calender Stack.

1—80" Pusey & Jones—11 roll Calender Stack.

1—30" x 160" Farrel-Birmingham Roll Grinder. Factory rebuilt in 1954 at a cost of $18,500.00. New drives and latest type of equipment.

27—48" x 110" Bagley & Sewall Dryers.

21—48" x 82" Pusey & Jones Dryers.

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1—120" Pusey & Jones 2-Drum Winder. Anti Friction Bearings.

1—110" Pusey & Jones 2-Drum Winder. Anti Friction Bearings.

7—14 Plate Impco Flat Screens, Bronze Vats, latest type, direct motor drives, S.S. Plates.

1—Waxing Machine, complete with Vilter Refrigeration Equipment and Drives.

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1—Hamblet Layboy, Serial No. 1140, Fully Equipped.

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1—84" Kamyr Machine Complete. 75 Ton per day.

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2—22" Dia. x 156" Rubber Covered Press Rolls.

2—84" Bagley & Sewall Wet Machines.

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1—Cowls Hydraslusher Model 10 SD.

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#3A Bird, Copper Vat
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Smythe 4-plate flat, with shaker

VATS

3—Downingtown Vats, C.I. Ends, cypress sides
3—42″ x 86″ cylinder moulds, a.f. bearings
3—16″ Rubber couches
3—Sandusky Showers
1—Felt whipper and Sandusky shower
1—Suction box
1—Sandusky Suction Press

PRESSES

First and Second
2—Top, brass 15″ x 84″
2—Bottom, rubber 15″ x 84″
Horne Smooth press, pneu. controls (new 1956)

DRYERS

21—36″ x 82″ Downingtown, fr. bearings
1—Sandy Hill Breaker Stack w/in.-drive, pneu. controls (new 1957)
1—Stickle Tension Roll steam control system & controls (new 1957)
23—Stickle micro-orifice visible drains (new 1957)
1—Stickle Vacuum Pump (new 1957)

CALENDERS

1—5 roll Downingtown 84″ face
1—7 roll (originally 8) 84″ face
1—Set embossing rolls 9 lines to inch

REEL

1—2 drum upright

WINDER-SLITTER

1—Moore and White w/new (1956) electric drive

DRIVES

Mortise bevel gear corners
#7 ¾ Reeves w/75 HP motor

PIPING

Stainless steel recirculating system

PUMPS

1—Nash H7 vacuum 50 HP
1—Nash Hytor vacuum 10 HP
2—Shartle 8″ x 6″
3—Shartle 12″ x 10″ white water suction 20 HP
2—Harmain centr. 6″ x 6″ 800 gpm 40′ Hd.

STOCK CLEANING

2—Primary Bird Dirtecs (new 1957)
2—Sec. Bird Dirtecs (New 1957)
2—Nichols Vortraps

BEATERS

4—Downingtown Iron Tub 1200 lb., cement bottom, washers
1—Dilts 1000 lb.
1—Midwest 1600 lb., wedge type roll
1—Midwest 2500 lb., wedge type roll
1—Rotary Filter Screen
1—Rubber covered steel tank with PVC bleaching system, 1″

ROPE COOKERS

1—7000 lb. cap.
1—8000 lb. cap.

HOIST

1—Yale Electric and monorail system

BALER

Economy upstroke Style 172F5 (new 1956)
1—Miami No. 1 w/af bearings 150 HP motor and reducer
1—Miami No. 1 w/f bearings 150 HP motor and reducer
1—Clarkson chemical feeder

SAVE-ALL

1—Bird with couch and shower

MISC.

1—Cameron Rewinder 10-5A, 54″, 36″ dia. roll
1—Air compressor, 15 HP DeVilbiss
25—Broke boxes each with 4 b.b. casters
1—Bird Consistency Regulator, Stnls, w/ controls, cap. 2000# hr. (new 1956)
1—2000# Dial springless floor scale
1—Budget 1 ton elect. hoist
2—Hand roll trucks
2—4 wheel trucks
1—Rope Duster 15 HP
1—Budgit 2 ton chain block
1—Horizontal caustic soda tank 6′ x 8′ steel
1—Battery Lewis Shepard Jackstacker 1500# cap. w/generator
1—Weld-built Elevator 1000# cap. 10′ lift
1—Lewis Shepard 2000# hyd. pallet truck
1—Yale and Towne power winch

LABORATORY

1—Schopper tensile tester w/strip cutter (new 1956)
1—Perkins Mullen Tester
1—Elmendorf Tear Tester
2—Thwing-Albert Basis Wgt scales
2—Gurley densometers (new 1957)
1—Automatic micrometer (new 1957)
1—Macbeth Ph meter
1—Hart moisture meter
1—24″ paper cutter
1—Pelouze postal scale (5 lb. cap.)
1—Absorption tester
1—Brightness Tester, Photovolt
1—Freeness Tester, Canadian Standard

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1—Shartle Single Plunger
1—Shartle, Centrif. 2800 gpm at 20′ hd.

PUMPS, WATER

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1—Louis Allis, 15 hp 100 gpm 3500 rpm
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Also several low head high volume pumps 1 ea. Boiler feed pumps, steam and electric

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1—Craftsman Double End Grinder, floor pedestal type, 1/3 HP motor 115 V., 3450 RPM
1—Craftsman 6″ Jointer, 1 HP motor, 115 V., 3450 RPM
1—Dunlap Utility Hack Saw, ½ HP 110 V., motor, 1725 RPM
1—Pamco Arbor Press #2
1—Craftsman Quick Change Gear Lathe, 52″ bed, 1/3 HP, 115 V., 60 cycle, 1750 RPM motor
1—Atlas Bench Shaper with vise, ½ Hp, 110/220 V. 1 phase, 60 cycle, 1750 RPM motor
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1—Prentice Bros. 18″ Drill Press, 2 HP Link-weld motor 440 volt, 3 phase, 60 cycle, 720 RPM
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2—Large Anvils
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1—Atlas Rip Saw. pp. 8″ dia. blade with side extensions, 1 HP 220/440 V., 60 cycle, 3450 RPM motor
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While we strive for accuracy in preparing the above index which is purely a service to our readers, we cannot be responsible for errors.

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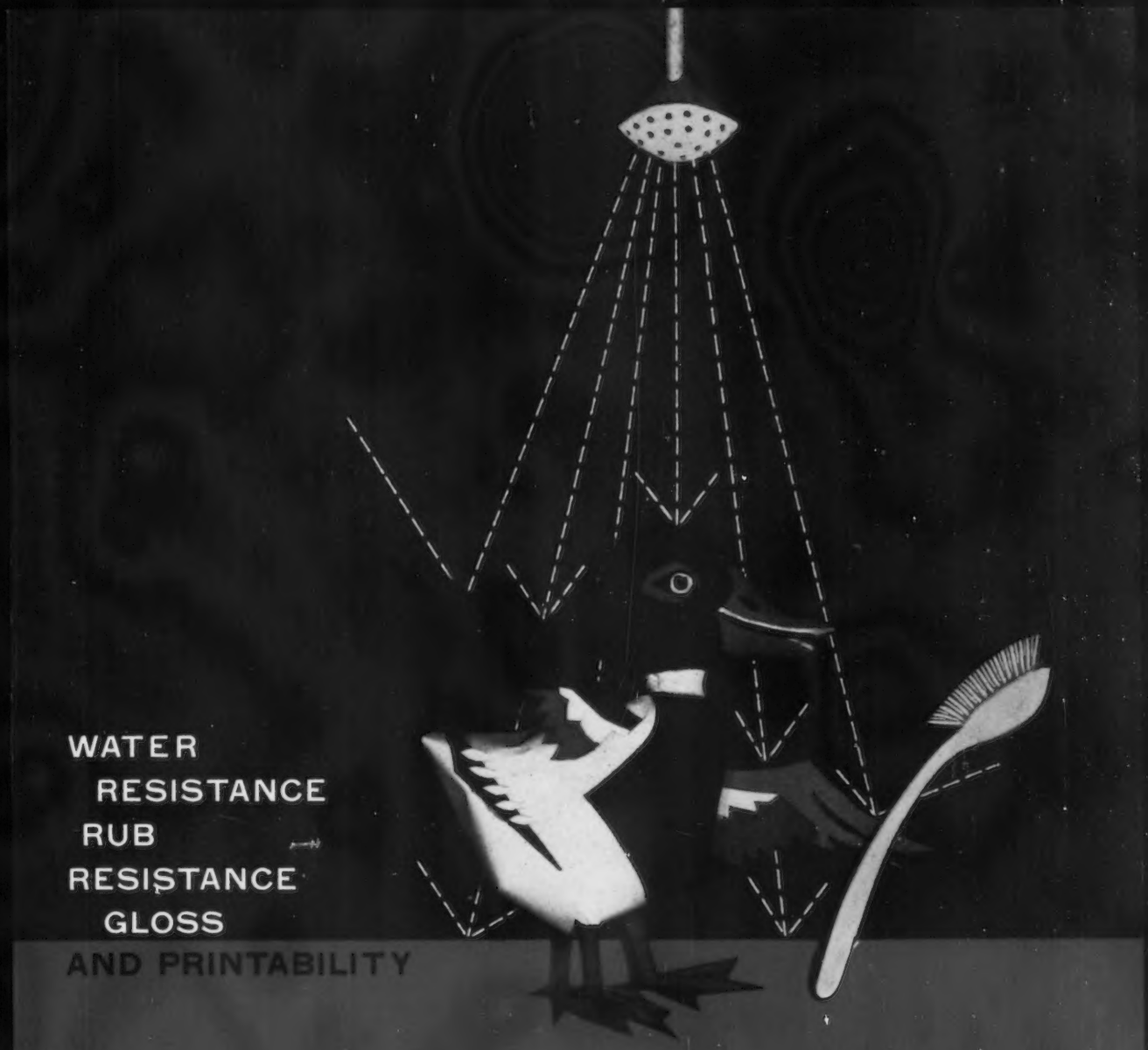

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